THE IRON AGE

Contents

MAY 27, 1937

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Reinforcing Bars
Babbitt Metal and Solder

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MAY 27, 1937

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Crutches Versus Footwork

A DEPRESSION develops complexes. Sometimes they are good ones, sometimes bad. And they give people "hangovers."

Going "up against it" brings out the best qualities of some men and women. They tighten their belts, throw out their chests and redouble their efforts. These are the people whom depressions cannot lick. If they are forced to accept assistance, public or private, during some period of the emergency, they cannot rest until they are back on their own feet again.

On the other hand, there are people in whom the depression has seemed to develop a permanent inferiority complex. They have become accustomed to the use of crutches and do not seem able to abide the thought of ever discarding them.

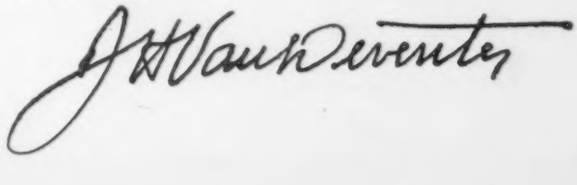
This is just as true in the case of some who have been employed throughout the depression as it is of some who have been unemployed and who are still upon Government relief. The difference is that there is an excuse for the people in the latter class, but none at all for those in the former.

The industrial executive who finds an "inferiority complex" in his sales department as a depression hangover is indeed out of luck. Perhaps you have observed cases of this kind.

A salesman, or perhaps a sales manager, becomes obsessed with the idea that his competitor has a better and more salable product because that competitor is making relatively greater sales gains than he is. He may be using pre-depression or even mid-Victorian sales methods, but it never enters his mind that he or these are to blame. It is always the product. If the designers would only change the position of the levers and handles and the production department paint the product a different color, he is sure that he could beat "heck" out of competition.

The inferiority complex victim in the sales department becomes an "alibi artist." "Passing the buck" is generally a positive symptom of the disease. And it is usually passed to the production department. By and large there have been very few instances of inferiority complexes in the production departments of our industry during the depression. They have tightened their belts, improved their products and given the salesmen vastly improved values to sell.

But even the finest values in the world and the lowest price will not solve the competitive problem where there is an inferiority complex in the sales manager's office. Sometimes you find instances of superior selling of a product with less excellence and a higher price than its competition. The reason for this is that, not having all of the advantages of superior product, the more aggressive sales organization compensates by superior headwork and more footwork.



REAL FACTS on Industrial

By PHILIP E. BLISS

President, The Warner & Swasey Company, Cleveland, Ohio.

THE Warner & Swasey Company has just received what we feel to be particularly significant comments on the employment situation, from 229 representative industrial concerns in the United States, employing a total of almost 800,000 people. The facts thus gathered, we believe, are of vital interest to all businesses—particularly those engaged in manufacturing enterprises.

For many months we, like other business men, had read a great deal in the magazines and newspapers about the unemployment situation. Yet at the same time we were also told that businesses all over the country were suffering from an acute shortage of skilled workmen. It seemed somewhat of a paradox to see on one page a story that thousands of men couldn't find work, and on the next page a story that employers couldn't find men.

It was particularly important for our own business that we try to ascertain the actual facts. Our company manufactures machine tools — particularly, turret lathes. The productivity of the turret lathes we sell depends to no small extent upon the capabilities of the men who operate them.

If customers buying turret lathes were literally unable to find enough men who knew how to operate turret lathes efficiently, this would bring to the fore a serious problem in which we would naturally be vitally concerned.

If, on the other hand, the current talk of shortage of skilled labor was largely talk arising from the fact that various companies who had not had occasion to hire new men for a long time were undergoing the routine difficulties of a reemployment program, there would be less occasion for concern.

In short, we wanted to find the real answer to the questions—Is there a shortage of trained men in industry? And if so, what is to be done about it?

Method of Gathering Facts

The method which we employed to get the answers to these questions was the time-worn one of sending out a questionnaire; but this was a questionnaire with a difference.

We selected as recipients only people whose answers would be important and representative. We picked 410 firms covering a wide range of industrial activities throughout the entire country, all of whom were engaged in important industrial enterprises.

We made our questionnaire as brief as possible, and set it up in

Employment

As Given by 229 Companies Employing 791,820 People

such a way that it could be answered with a minimum of time and effort. We asked merely for direct answers to specific questions.

The questionnaire was as follows:

QUESTIONNAIRE

1. Are you experiencing a shortage of skilled labor?
2. What classifications of workmen are you now most in need of?
3. Which of the following methods is in your experience proving the most practicable for renewing the supply of trained men: (Check your preference)
   a. Employing unskilled men and teaching them in your own plant
   b. Setting up a joint training school cooperatively run by industries
   c. Relying on trade and vocational schools now existing as part of your city's school system
4. Have men taken into your employ during the last two years come largely from relief rolls and federal employment?
5. Do you secure in your city any active cooperation between federal relief or public works agencies along the line of transferring men from government relief or pay rolls onto private employment"
6. How many men does your company employ?

Of the 410 firms receiving the questionnaire, 229 answered. These 229 employ a total of 791,820 people. The businesses in which they are engaged are too various to attempt to list in this article. They include all leading manufacturing industries of the country—and it would be difficult to call to name a branch of industry which is not included in the list.

Most of the questionnaires were returned with a letter signed by an executive of the company receiving the questionnaire, indicating that the answers had been given careful consideration by people properly qualified to supply the information requested.

The simplest method of summarizing the answers is to take up each question in consecutive order.

Are You Experiencing a Shortage of Skilled Labor?

Of the 229 firms answering, 195 said "yes"; 34 said "no."

It is significant that the firms who have a shortage of skilled labor answered this question with the one word "yes"—whereas many of the firms who reported in the negative added such phrases as the following:

"Expect prevailing shortage to disappear shortly."

"Shortage no more than normal for this stage of cycle."

"No shortage at present but expect a big one if expansion continues."

"No shortage, but would be if payroll were increased."

"Shortage is not yet acute."

"Shortage not enough to curtail production but couldn't get more skilled men from outside if needed."

In short, out of the 34 who reported no shortage, a comparatively large proportion qualified their answers in the above fashion.

On the whole, therefore, there seems to be no doubt there is at the present time a serious shortage of skilled labor.

What Classifications of Workmen Are You Now Most in Need Of?

Naturally answers to this question were given only by the firms who said they were experiencing a shortage of skilled labor. There were many duplications in the answers, because job classification terminology is rather broad, and a single general classification may include various specific classifications.

However, a tabulation of replies as actually received is rather interesting. Types of workmen needed are listed in the following order:

Type of Workmen	Number of Firms Mentioning Need for
Machinists	89
Tool Makers	60
Machine Operators	48
Lathe Operators	34
Boring Mill Operators	32
Automatic Screw Machine Operators	26
Molders	22
Machine Assemblers	18
Machine Grinders	18
Die Makers	17
Mechanics	14
Hand Screw Machine Operators	10
Pattern Makers	10
Planers	10
Sheet Metal Men	10
Welders	7
Draftsmen	7
Electricians	7
Core Makers	6
Fitters	6

Twenty-six other specific trade occupations were mentioned in lesser degree.

It is significant that no firm reported a shortage of unskilled labor. Although the question was phrased, "Are you experiencing a shortage of skilled labor?", it would seem probable that if a company thus queried had experienced a shortage of unskilled labor, it would have replied to that effect. Not a single company indicated that such was the case.

Preferable Method for Renewing Supply of Trained Men

We asked companies to indicate which method was, in their experience, proving the more practicable for renewing the supply of trained men—employing unskilled men and teaching them in their own plants, setting up a joint school cooperatively run by industries, or relying upon trade and vocational schools.

Naturally there was some overlapping as to preferences indicated. On the whole, however, the answer was overwhelmingly in favor of employing unskilled men and teaching them within the plant. One hundred and thirty-three firms replied as being flatly in favor of this method; while only 7 said they preferred the method of setting up a joint training school cooperatively run by industries, and only 18 said they relied upon trade and vocational schools. Fifty-seven firms said that they were both training their own men and utilizing men from trade and vocational schools; 5 firms said that they were training their own men and also depending upon joint training schools cooperatively run by industries; 6 firms said they were using all three methods.

Some of the comments volunteered in connection with this subject are particularly interesting.

One company replied, "For machinists we have had to rely upon other industries to furnish experienced men." Naturally, this course of action provides no permanent remedy. It is interesting that this same company adds, "We are considering setting up an educational program within our factory."

Many companies mentioned plans and progress with respect to apprentice training schools, but were inclined to question the time element, the difficulty being that of training men rapidly enough on an apprenticeship system to meet present-day needs. A number of companies mentioned the advantages of securing men who had had some vocational guidance in public and other schools, but seemed to feel that education along these lines, although a help, was not a solution. Remarks of this nature serve to strengthen the majority conclusion that the best method of renewing the supply of trained men is to take them in and train them.

Relief Rolls and Government Employment

In answer to the question, "Have men taken into your employ during the last two years come largely from relief rolls or federal employment?" 182 firms answered "no"; 39 answered "yes"; and some made no definite answer. On the surface this might appear to indicate—either that men on relief or government projects are chiefly, as has so often been said, in the unemployable class—or that relief and government agencies had not made proper effort to transfer men from government projects or relief onto industrial payrolls.

However, the answers to the next question throw a different light on the subject. In answer

to the question, "Do you secure in your city any active cooperation between federal relief or public works agencies along the line of transferring men from government relief or payrolls onto private employment?" 97 firms out of the 229 replying definitely said "yes."

Among comments regarding such cooperation appeared many such as the following:

"Yes, a very good relationship."

"Yes, the state employment service has been helpful."

"Yes, cooperation has been offered by any federal employment department."

"Yes, government agents follow this up very closely."

"Yes, they are actively trying to place help."

"Yes, the county relief administration and labor co-ordinating bureau have been active in placing men."

The fact appears to be, therefore, that government and relief agencies have been more active in trying to transfer men from public dole to private employment than some of us at least had realized.

Does this mean then that failure to effect such transfer to a larger degree is due to the inferior character or the abilities of the people on relief or federal projects? To a certain extent, yes. For instance, there are comments along this line:

"Men on relief or federal payrolls are no good—ruined."

"Most of these men are not worth a damn."

"Do not have the kind of men we can use."

"Fight shy of trying to get men off relief because relief wages have spoiled a good many men."

"Such men are generally unsatisfactory."

On the other hand, one company makes a very important and pertinent comment. This company says:

"We have hired approximately 300 men

We are sending you this questionnaire in the hope that your answer and that of other companies will provide a factual picture of the present employment situation.

None of the figures given by individual companies, nor company names, will be used. All answers will be grouped and so reported. We will send you a summary of the answers given.

QUESTIONNAIRE

1. Are you experiencing a shortage of skilled labor? .....

2. What classifications of workmen are you now most in need of? .....

3. Which of the following methods is in your experience proving the most practicable for renewing the supply of trained men? (Check your preference.)

   a. Employing unskilled men and teaching them in your own plant. .....

   b. Setting up a joint training school co-operatively run by industries.

   c. Relying on trade and vocational schools now existing as part of your city's school system. .....

4. Have men taken into your employ during the last two years come largely from relief rolls and federal employment? .....

5. Do you secure in your city any active co-operation between federal relief or public works agencies along the line of transferring men from government relief or pay rolls onto private employment? .....

6. How many men does your company employ? .....

Please fill out and return to: Warner Seely, Secretary,
The Warner & Swasey Company,
Cleveland, Ohio.

The simple but unusual questionnaire that was used to gather the data.

from these sources, of which about 35 remained; balance released or quit. Majority either lack skill or have no desire to work."

It seems to me very significant that this company, which has been through the experience of trying to take men off public projects and relief, found that a little better than 10 per cent of these men proved sufficiently adaptable to remain in permanent employment. The point is that this percentage is almost as high as that which many companies experience among applicants answering newspaper ads for employment.

Evidently a fair share of people on relief or public projects can be trained and placed in industry; and from further studying the comments on the questionnaires, it seems evident that one reason why such a comparatively small number of men have thus been transferred has been the attitude of industry itself toward these men. It may be quite true that many of them are not constitutionally fitted for industrial employment — but certainly industry should endeavor to take a more active part in the sorting-out process. Some of the comments to the questionnaire indicate that industry as a whole has not made a determined effort along this line. With apparently practically all the skilled workers of the country already working, industry might at least make a broader effort to try out men on relief or federal payrolls—just as it today must of necessity experiment with younger men now coming into the employment field.

Conclusions

The main import of replies to the questionnaire lies, of course, in the opinions expressed as to need for trained men and method of training them.

The great majority of replying firms said, "We are experiencing a shortage of skilled labor."

The great majority said the best method of remedying this situation is "to employ unskilled men and train them in our own plants."

It seems to me that these answers definitely point the way toward the course of action which must now be pursued by industry.

If industry is to get the skilled men which industry needs, it must take in new men and train them in its own shops. This involves inevitably a program of weeding out the incompetent and the undesirable—but in this process men who have been on relief or government projects should be given at least "an even break" with the younger generation now arriving at factory employment age.

It is my own opinion—perhaps an unduly optimistic one — that within the next few years industry will have need of all the men which can possibly be trained during that period. To my mind, one of the most important steps which any industry can take today is to set up within its own plant a method whereby it tries out new men, sorts out the competent from the incompetent, and gains in the process a certain number of new, skilled workmen who will stand in good stead in the period of still greater productivity which I believe is today in store for American industry.

Inventor Projects Himself Into the Future

DR. E. F. NORTHRUP, well-known American scientist and inventor, former vice-president of the Leeds & Northrup Co. and authority on electrothermics, has written an imaginative story of the life, inventions, and reflections of a scientist living from 1920 to the year 2000 A.D.

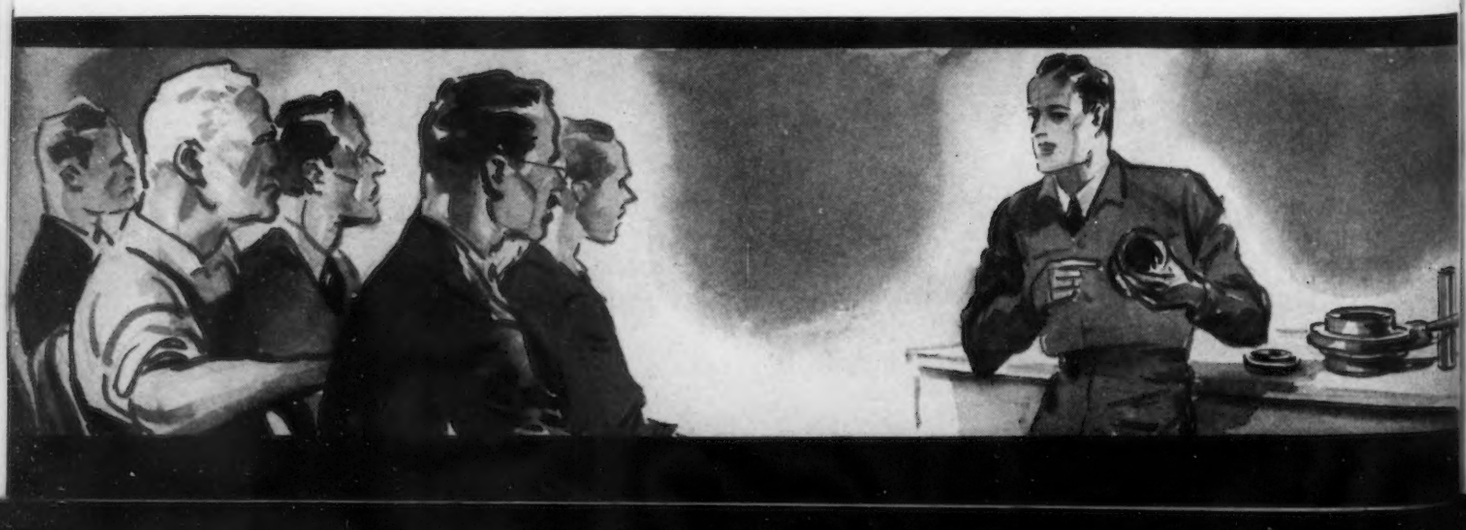
Readers will see that Dr. Northrup has drawn on his own life for the material in this unique modern autobiography. The book is original in its conception—nothing like it has ever come off the press—and technical matters of vast importance are disclosed. For instance, for the first time a solution is said to be presented for the escape by humans from the earth's gravitational attraction, and means for navigating projectile-ships in outer space are described.

The book also introduces many important applications of the "electric guns" with which Dr. Northrup has been experimenting—at the Ajax Electrothermic Corp. plant, at a government arsenal, and in the research laboratory of the General Electric Co. at Schenectady.

The writer of "Zero to Eighty," now 71 years old, has lived a productive life, that has lifted him to a place among the world's foremost scientists and brought him many awards in the scientific field. He feels that the technical matter disclosed in this book is the most important of his life's works.

The book, containing 29 illustrations, is an interesting narrative of the first humans to circumnavigate the moon, told in a lucid style, enjoyable and informative to the lay reader as well as to the scientist.

The author was the inventor of the Ajax-Northrup high frequency induction furnace.



The Consumer Is King—So What?

JOHN H. VAN DEVENTER

FOLLOWING is the full text of an address made by John H. Van Deventer, editor, The Iron Age, at the dinner meeting of the National Association of Purchasing Agents at Pittsburgh, May 24.

In presenting a review of some of the important present-day changes that are being forced upon the steel industry from without, Mr. Van Deventer pictured the effect upon the buyers and consumers of the world's greatest basic material.

TONIGHT I am addressing my remarks to the men who are primarily responsible for building the steel industry. I am speaking to the people who have the principal interest in its future; and who more than any others, have a vested interest in its welfare. I do not refer to the stockholders of the industry, nor to its management or its labor. I refer to you gentlemen who buy steel and who represent the vast army of steel consumers.

You all remember the definition of an island that we were obliged to learn in school. "An island is a body of land entirely surrounded by water." Without the water, there could be no island. It is like that in business. A successful business is one that is surrounded by customers. Without the consumers, there could and would be no business.

In these changing times the consumer is beginning to be pushed into an unfavorable position through the action of new and strange economic philosophies. He was left out in the cold for example in the theory enunciated as to the legality and morality of the sit-down strike. We were told in this connection that labor obtains a property interest in the company for which it works because of what it has contributed to that company. Strangely enough, and inconsistently, those who preach this doctrine do not extend it to include the buyers of the company's products—the consumers whose purchases finance both profits and payrolls.

I would think that the people who support an industry, and who keep it going, deserve consideration and the protection of their interests in any scheme of social modernization that may be proposed as a new philosophy for America. Not only do the consumers pay all of an industry's bills and all of its wages but they also pay for all of its mistakes and misfortunes. The economic change-lings all land, eventually, on the consumer's doorsteps, no matter who fathers or mothers them!

So tonight, let us look at this steel industry which you have built and which you support and without which you could not possibly get along any more than it could get along without you. Let us look at it from the standpoint of the changes that are now taking place in this industry and what these changes mean to your interests as buyers and consumers of our greatest basic product.

You should be interested in this, for the welfare and proper conduct of the steel industry mean as much to you, as consumers, as they mean to capital, management, and labor in the industry itself.

Great changes are taking place in the industry today. Unusual changes. If these changes are for the good of the industry, the buyers and consumers of steel will benefit far more than will the producers. If the changes damage or

injure the steel industry a thousand buyers and ten thousand consumers will suffer for each producer who is damaged.

Changes have always taken place in our industry. There have been plenty of changes in both the making and the marketing of steel since those days, little more than 150 years ago, when the making of iron in America was a bootleg industry, forbidden by British law. But today's changes are vastly different from those which have gone before. In the past, changes in the steel business, like in all American business, have been brought about by the natural evolution of experience, discovery, and steady improvement. Evolution means change. But not all change is evolution.

Reversing Evolution

Today, in influential government circles, and with certain economists, the theory of improvement of industry by evolution seems to be as unpopular as was the teaching of the Darwinian theory which occasioned the famous Scopes trial.

Then, you will remember, William Jennings Bryan, the silver voiced fundamentalist, held that it was impossible to make men out of monkeys through the operation of natural laws. Today some of us are beginning to believe that the reverse process, at least, is practicable and that monkeys are now being made out of men through the operation of unnatural laws!

Evolution is too slow to suit the American taste today. We want to go places in a hurry. Change is the order of the day, but orders come from Washington, through executive mandate and legislation.

Up to noon on April 1, 1937, there had been introduced in this present Congress, a total of 8090 pieces of proposed legislation. Most of these bills—and the average is 13 apiece for each lawmaker—have to do with some change, modification or regulation of ways of doing business. Many of them would affect the steel industry, if carried through into law.

Fortunately for us Congress is not as efficient as is our Supreme Court is keeping up with its docket. For to date, but 10 of these measures have been enacted into law. Eight thousand and eighty of them are still behind the bars, but clamoring to be released to roam the fields of American business.

When industrial and business changes are brought about by mandate and by legislation, instead of, as formerly, by the natural progress of evolution, the buyer and the consumer are the ones most likely to suffer. For they are losing their rightful former positions as the promoters of industrial change and improvement and surrendering them to the dictatorship of the politician and the demagogue.

The consumer is the logical and the rightful boss of American industry. He is the man who pays the bills. He has demanded recognition and in the past has gotten it. His desire for continuous improvement in quality of products and for reduction in costs has spurred American industry to unparalleled peaks of accomplishment. He is the man who has dictated the policies of great and small corporations; who has commanded the erection of new plants or the modernization and relocation of existing ones. The steel industry has been one of our many progressive American industries which have long recognized the consumer's natural and predominant right to the head seat at their tables.

Consumer Has Been Boss

The consumer has earned that seat at industry's table because industrial evolution, operating through the natural laws of competition and initiative, has put him there. He has been the man who in both the literal and the metaphoric sense has given the orders. Because of this, he has been able to protect his interests. His voice has been heard and heeded.

Today, the consumer is being ejected from the head seat at industry's table. It is not through any desire or action on the part of industry that this is taking place, for industry values its consumers. It is the inevitable result of the discarding, by Government, of the natural law of industrial evolution and the substitution in its place, of control of business by mandate, legislation and conversation.

For an industry that started scarcely two centuries ago in America with a single product, charcoal iron, the steel business has grown to be a remarkably complex one. No industry has more variety of product. The American Iron and Steel Institute during code days, for example, listed prices on more than 100,000 shapes, sizes and compositions of steel, and this in the standard, "run-of-mill" portion of the industry. When it comes to special alloy steels, the number becomes almost infinite. One producer of alloy steels, for example, is prepared to furnish over 1800 composition varieties.

Equally complex, of necessity, are the merchandising methods. These, like the technical branching out of the industry, have been the result of evolution. And evolution, in both making and marketing methods, has been inspired, through good sound business sense, by the desire to render better or fairer service to the American steel consumer.

Experience Has Built Slowly

Many of these marketing methods, built slowly and through long experience and for the mutual benefit of consumers and producers, are now threatened with destruction or serious modification by Government mandate. The request for change does not come from the consumers, except in isolated cases in which a change would result in a preferential position for the few and damage to the many. And if these changes should be brought about, 99 out of every 100 steel buyers and consumers will be penalized for every one that will benefit.

Take, for example, the basing point system. This system equalizes the price competition for steel among widely distributed buyers and consumers. It is of primary benefit to that great majority of steel consuming units which are not or cannot be located near steel producing centers, and to the smaller producing units which cannot afford a widely distributed chain of producing plants. If, as threatened, steel is forced to merchandise its product on an f.o.b. mill basis, steel consumers and fabricators who do not happen to be situated close to mills or who cannot move there would be penalized, competitively, from $2 to $8 per ton. That is unless all of the manufacturers of steel products moved their plants to Pittsburgh, or Chicago or other steel producing centers. And that surely would result in extremely uncomfortable and unhealthy congestion. Certainly it would be the reverse of the modern idea of decentralization.

(CONTINUED ON PAGE 121)

G. B. WATERHOUSE

Developments in Production Metallurgy of Iron and Steel*

By GEORGE B. WATERHOUSE

Professor of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

THIS paper plans to cover briefly some of the recent developments in iron and steel metallurgy.

One of the best ways to keep in touch with developments of any kind is to study the literature of the subject. The present topic is no exception, and attention may be drawn to the annual review issues of the technical magazines such as IRON AGE, *Steel*, and *Iron and Coal Trades Review*, usually appearing early in January of each year. Such magazines give a wealth of statistical and other information. One article, however, deserves special notice. It is a paper presented at the recent joint meeting of the Iron and Steel Institute and the Verein Deutsche Eisenhuttenleute at Dusseldorf, Germany, by Fritz Springorum, President of the Verein. It is printed in *Stahl und Eisen* in both German and English and is also published in the last volume of the Journal of the Iron and Steel Institute.[1] It covers in a splendid manner technical developments in German practice during the last 15 years.

In regard to raw materials an increasing amount of attention is being paid to proper preparation, notably of iron ore. This is not particularly new because for some years it has been realized that proper sizing and preparation of ore, limestone and coke is necessary for the best blast furnace practice. There have been many papers published on this important subject, especially by the workers in the Iron and Steel section of the United States Bureau of Mines. A recent paper by T. L. Joseph[2] may be mentioned, in which he tested the reducibility of many kinds of iron ore, and drew some very interesting conclusions based on practice. "If large lumps of hard dense ore are charged into the blast furnace they will reach the top of the bosh and the fusion zone with unreduced centers. The size of such ores should be reduced according to the porosity, which has been shown to bear a direct relation to the time required for reduction. Finer crushing has improved furnace practice on Alabama ores and Utah ores." This is true also of the dense Wabana ore of Newfoundland.

It is recognized, too, that fines should be sintered for good practice and careful attention is being given to this in modern plants, both here and abroad. The whole matter of proper preparation of raw materials for blast furnace practice, and proper methods of charging, appears to be so well founded that it would seem to be axiomatic, but while considerable progress is being made there are many plants paying little or no attention to the subject, and some can still be found where the ore varies from fines to pieces over one hundred pounds in weight.

Recent developments in blast furnace design have been along conservative lines. The size of the

*Presented before the general meeting of the American Iron and Steel Institute, New York, May 27.

TABLE I

Blast Furnace Practice at Corby, England, Showing Comparative Production Data in Manufacture of Low-Silicon Iron from Ores of High Alumina/Silica Ratio

Average analysis of ores:	SiO_2	Al_2O_3	CaO	S	P	Fe	Moisture
Carbonate, per cent	7.55	6.00	13.6	0.37	0.6	31.4	13
Brown-weathered, per cent	10.5	7.9	3.5	0.05	0.65	33.2	13
Type of slag	Slag of normal basicity.				Slag of low basicity.		
Ores used	100 per cent crushed and graded local and manganese.				100 per cent crushed and graded local and manganese and basic slag.		
Slag analysis (calculated to total 100 per cent):							
SiO_2	30.9				33.6		
Al_2O_3	22.1				26.0		
CaO	40.0				35.7		
MgO	7.0				4.7		
(S)	(1.42)				(1.80)		
Iron analysis, per cent:							
Silicon	0.55				0.6		
Sulphur	0.05				0.13		
Phosphorus	1.85				2.00		
Manganese	1.42				1.4		
Basicity of slag:							
$(CaO + MgO)/SiO_2$	1.51				1.20		
CaO/SiO_2	1.29				1.06		
Iron made per day; tons	238				288		
Limestone additions; lb.	1120				50		
Coke consumption; lb.	2875				2425		
Blast pressure; lb.	17.3				14.4		
Blast temperature; deg. F.	1210				1120		

hearth and the throat diameter continue to increase. More attention is being paid to proper reduction of the charge in the shaft so that when it enters the fusion zone it can be melted thoroughly and completely. The importance of a plentiful supply of air or blast is more fully recognized and with the modern furnaces large outputs of uniform, good iron are being obtained because of plentiful blast volume, high blast temperatures, coke that persists down to the tuyeres where it is promptly burned, and careful preparation and burdening of the charge.

A notable development in blast furnace practice has taken place in England during the last few years, at Corby in Northamptonshire. Corby is roughly half way between Sheffield and London in the middle of England. Three modern furnaces are smelting local ore and a fourth furnace will soon be in operation. The ore is mainly carbonate of iron with part of it weathered and changed to limonite. Formerly most of the carbonate was calcined before being charged but now the whole of the ore is charged raw into the furnaces. However, the ore is crushed and graded, a certain amount of the fines are sintered, and a very careful system of charging is followed. Calcination is carried out wholly within the shaft of the furnace. Turboblowers are used and a considerable degree of automatic control of blast volumes and temperatures is exercised.

The ore is low in iron content, much of it as low as 29 per cent, and the gangue has a high proportion of alumina to silica. A new system of burdening the furnace has been worked out, based on the formation of a low melting point slag with good viscosity, in other words a free running slag of relatively low melting point. The desirable limits of the slag were chosen after a careful study of the ternary diagram of the $CaO—SiO_2—Al_2O_3$ system, and the viscosity determinations of Prof. McCaffery and his students at the University of Wisconsin. The reasoning followed and some of the results obtained are given in a recent paper by T. P. Colclough[3], from which a few extracts may be given as they give a clear picture of what is being done and the principles followed are applicable to blast furnace practice in many places. "To give the optimum conditions for the smooth working and economical operation of a blast furnace, the burden should be arranged so that the slag formed has a melting point not exceeding 1400 deg. C (2250 deg. F) and preferably a practical operating maximum of 1375 deg. C (2500 deg. F). The difficulties which have been experienced in the manufacture of basic iron of low silicon content from ores having a high ratio of alumina to silica have arisen from charging the furnace with a mixture of ore

TABLE II

Four High Continuous Strip Mills in Operation, Under Construction and Authorized in the United States

Company	Location of Mill	Started Operating	Size	Annual Capacity (G.T.)
Allegheny Steel Co.	Brackenridge, Pa.	1932	38 in.	275,000
American Rolling Mill Co.	Middletown, Ohio	1928	72 in.	372,000
	Butler, Pa.	1926	48 in.	312,500
Bethlehem Steel Co.	Lackawanna, N. Y.	1936	79 in.	600,000
	*Sparrows Point, Md.		56 in.	600,000
Carnegie-Illinois Steel Corp.	Gary, Ind.	1927	42 in.	360,000
	Gary, Ind.	1936	80 in.	600,000
	Gary, Ind.	1935	38 in.	270,000
	So. Chicago, Ill.	1931	96 in.	720,000
	McDonald, Ohio	1935	43 in.	300,000
	†Clairton, Pa.		80 in.	600,000
	Homestead, Pa.	1937	100 in.	729,000
Ford Motor Co.	Dearborn, Mich.	1935	56 in.	500,000
Great Lakes Steel Corp.	Ecorse, Mich.	1930	38 in.	400,000
	Ecorse, Mich.	1936	96 in.	720,000
Granite City Steel Co.	Granite City, Ill.	1937	90 in.	275,000
Inland Steel Co.	Indiana Harbor, Ind.	1932	76 in.	600,000
Jones & Laughlin Steel Corp.	Pittsburgh, Pa.	1937	96 in.	720,000
Laclede Steel Co.	Alton, Ill.	1927	22 in.	140,000
Otis Steel Co.	Cleveland, Ohio	1932	72 in.	375,000
Republic Steel Corp.	Warren, Ohio	1927	42 in.	302,000
	*Cleveland, Ohio		98 in.	800,000
Sharon Steel Corp.	Sharon, Pa.	1929	24 in.	175,000
Tennessee Coal, Iron & R. R. Co.	†Birmingham, Ala.		48 in.	300,000
Weirton Steel Co.	Weirton, W. Va.	1927	54 in.	550,000
Wheeling Steel Corp.	Steubenville, Ohio	1929	60 in.	540,000
Youngstown Sheet & Tube Co.	Campbell, Ohio	1935	79 in.	600,000
	TOTAL			12,735,500

*Under construction.
†Authorized (estimated capacity given).

and limestone which formed slags of melting points which exceed this practical working limit. In order to form slags which shall have free-running properties and melt at a suitable distance above the combustion zone in the furnace, the lime content of the slag must be varied progressively as the alumina content rises above or falls below a mean value of about 17 per cent. To attain this object the basicity factor or ratio of lime to silica must be decreased progressively from the value of 1.15 for a slag of 18 per cent Al_2O_3 to approximately 1.0 for slags of 5 per cent or of 30 per cent Al_2O_3, these percentages being based on the calculated values with the SiO_2, Al_2O_3, CaO and MgO contents totalling 100 per cent.

The deductions just outlined have been applied in practice. A thorough examination was made of the ore deposits, to determine the possibility of assembling a mixture of the local ores available which would yield slags within the normal working range of alumina content. Experiments were also made on the lines commonly adopted of diluting the alumina content by increasing the slag volume by the addition of siliceous materials to the burden. None of these attempts yielded the desired economic results.

It was decided to base the manufacture of pig iron on the local ores alone and according to the principles outlined above. In the old practice, from one-third to the whole of the ore was calcined prior to charging, and this was applied specially to the carbonate type of ore, only the weathered or hydrated ore being charged in the raw state. The calcination of the ore has been discontinued, and the whole of the ore is charged raw into the furnace. To ensure complete reduction and preheating of the ore in the stack, the ore was crushed and graded, the screened sizes being charged separately from the fines. Finally, in opposition to the usual practice of seeking to improve the fluidity of the slag and the smoothness of operation by raising the hearth temperature by additions of lime and increasing the coke ratio, the slag was made more siliceous by reducing the lime additions, and the coke ratio was decreased by increasing the ratio of ore to coke.

The operating results fully confirmed the theoretical deductions. With the furnace engaged on the manufacture of foundry iron, the lime content of the slag was reduced from 40 to 35 per cent and the alumina content rose from 25 to 28 per cent. The rate of production showed an increase of 15 per cent while the coke consumption decreased 17 per cent.

In the manufacture of steel making or low silicon iron the results are even more striking. With a furnace specifically designed for operation on this class of ore, and with the ore crushed and graded to the sizes necessary for its complete preheating and reduction before reaching the melting zone, Table I shows the change in practice effected by the application of the new principle of burdening the furnace.

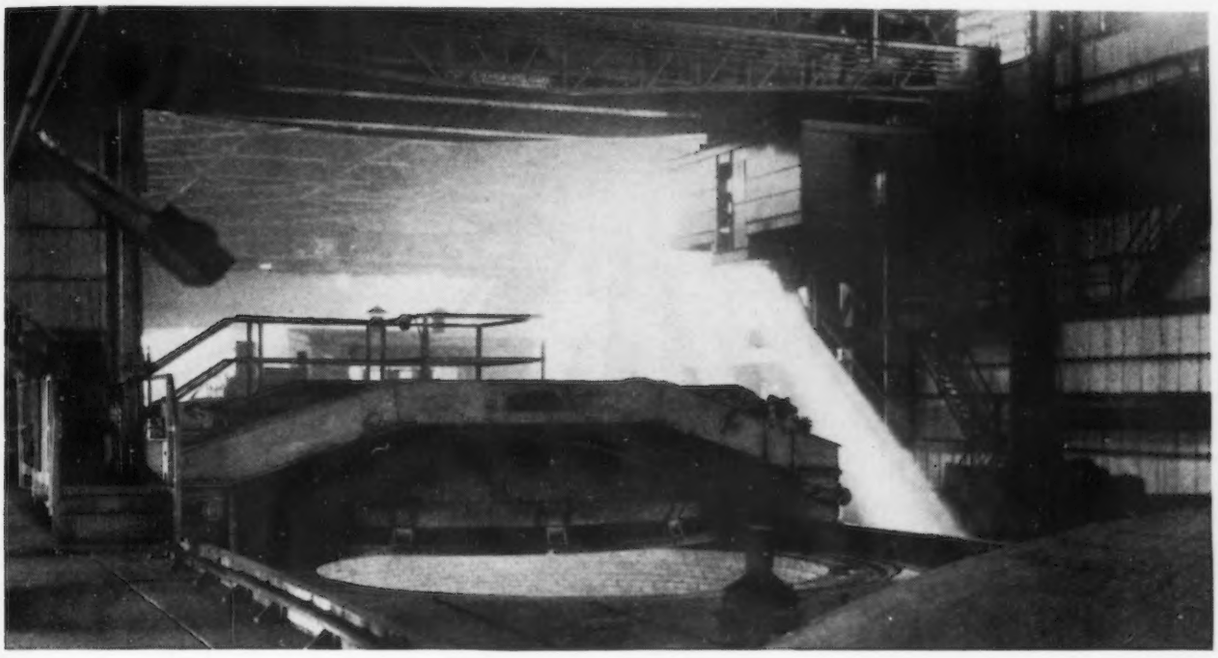


FIG. 1—Circular soaking pit with cover removed.

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No change was made in the class or preparation of the ore used, the only variation being in the amount of lime additions. It will be seen that production was raised by 21 per cent and coke consumption was reduced 450 pounds, or 15 per cent.

In a second, slightly larger furnace working with additions of scrap to bring the iron content of the burden to 35 per cent, and again operating with a true slag of 33.5 per cent SiO_2, 25.9 per cent Al_2O_3, 36.0 per cent CaO and 4.6 per cent MgO; or a ratio of CaO to SiO_2 of 1.08 to 1.0, the production of low silicon iron averaged 376 tons per day on a coke consumption of 2130 pounds per ton of iron.

The most important feature of the practice based on this principle is the regularity of operation, with its lower blast pressure, freedom

TABLE III

Tabulation of Mill and Drive Data—Continuous Strip Mill, Lackawanna, N. Y.

Mill	Characteristics	Work Roll Diameter, in In.	Backing up Roll Diameter, in In.	Roll Length, in In.	Motor Hp.	Volts	R.p.m.
Hot Mills							
Scale breaker	2 high 1 stand	24		76	1000	6600	375
Broadside mill	4 high 1 stand	36	49	96	3000	6600	150
Rougher	4 high 1 stand	24½	49	79	3000	6600	500
Rougher	4 high 1 stand	24½	49	79	3000	6600	500
Rougher	4 high 1 stand	24½	49	79	3000	6600	500
Scale breaker	2 high 1 stand				500	600	150 to 600
Finishing stand	4 high 1 stand	24½	49	79	3500	600	175 to 300
Finishing stand	4 high 1 stand	24½	49	79	3500	600	175 to 300
Finishing stand	4 high 1 stand	24½	49	79	3500	600	175 to 300
Finishing stand	4 high 1 stand	24½	49	79	4500	600	125 to 250
Finishing stand	4 high 1 stand	24½	49	79	4500	600	125 to 250
Finishing stand	4 high 1 stand	24½	49	79	2500	600	175 to 350
Cold Mill							
Tandem mill	4 high 3 stand	20	49	75	(3)1250	600	300 to 600
Tandem mill	4 high 3 stand	20	49	54	(3)1250	600	300 to 600
Skin pass mill	4 high 1 stand	20	49	75	1250	600	300 to 600
Skin pass mill	4 high 1 stand	20	49	75	1250	600	300 to 600
Skin pass mill	4 high 1 stand	20	49	93	1250	600	300 to 600
Skin pass mill	2 high 1 stand	28	49	55	250	250	500 to 1000

from scaffolding and uniformity of composition of the iron.

A study of Table I is very instructive. The improved results are given in the second column and are striking. A visit to the plant to observe the operating results confirmed the table. The furnaces are working smoothly, giving good tonnage and with low fuel consumption. The managers of the plant are to be congratulated on the results being obtained, and for the courage they have shown in applying theoretical research work to practical problems. Incidentally they are producing almost the cheapest pig iron in the world.

The sulphur in the pig iron at Corby often runs higher than shown in the table. This high sulphur is taken care of largely by additions of sodium carbonate to the iron in the ladle. This treatment of iron to reduce sulphur is a fairly recent development. It is being used a great deal in foundries to offset the sulphur pick-up in cupola melting, but a few steel plants abroad are using it to reduce the sulphur in steel-making iron. All open hearth operators know the trouble and delay caused in trying to remove sulphur and this development is worth watching.

Open Hearth Developments

The developments in regard to the open hearth have been along three main directions: design, heat economy and operation. A number of new open hearth furnaces have been constructed recently and the features of design are worth careful study. Among the new furnaces may be mentioned those of the Great Lakes Steel Corp. at Detroit, the Bethlehem Steel Co. at Lackawanna, and the Inland Steel Co. near Chicago.

All are marked by the careful use of insulating brick or material around the furnaces, flues and checkers, whereby the heat efficiency is considerably increased over older furnaces. The Bethlehem plant has many other features of interest. It is exceedingly spacious with a very wide working floor. Coke oven gas is the main fuel and each furnace is equipped with automatic control devices for the fuels and for air. Everything on the ground floor is readily accessible, and a new system or division of the checkers has been worked out so that there are eight checker chambers instead of four. Also there are no waste heat boilers. One matter of interest, which is now common to many open hearth plants, is the use of the carbometer to determine the carbon in the test samples. None of the foregoing features are revolutionary or particularly new, but are logical developments of open hearth practice over the last few years.

Another development which continues to attract attention is slag control. This reaches back to a careful study of the charge and an effort to produce the proper slag as early in the history of the heat as possible. Slag control is being watched and followed all over the world and very good results are being obtained in improved quality of steel and uniformity of product.

The most notable recent development in methods of steel production is the rebirth or renaissance of the basic Bessemer process in England. Many improvements have been made in this process in Germany in recent years. The size of the vessel has been increased until now some vessels are operated with charges up to 50 tons, and it is thought that this figure could be safely increased. Some details of the improvements along these lines are given in the paper by Springorum.[1] However, in England this process had completely disappeared and was only revived recently at the plant at Corby mentioned before. Three converters were installed of about 30 tons maximum capacity each, and a fourth has just been added. It will be noticed that the composition of the iron given in Table I is particularly suited to this process, and the supplies of ore are very large. The steel being made is going mostly into pipe but it is suitable for many other purposes.

Progress in Refractories

Before leaving the steel making processes mention should be made of the good work being done in

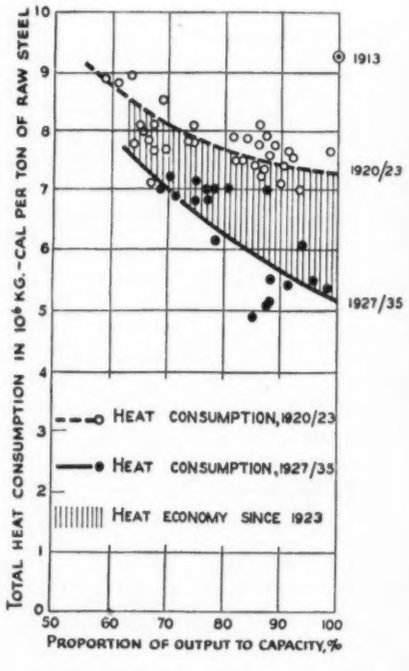

FIG. 2—Decrease of the heat consumption per ton of raw steel by planned heat economy in German practice.

the field of refractories, especially with basic and neutral refractories, one phase of which is well covered in a recent paper by L. J. Trostel[4] and the accompanying discussion. A certain class of bricks is dried and not burned. The bricks are formed by adding special inorganic refractory binding agents to the mix, using very high hydraulic pressures to mold the bricks, and then drying. Great care is used in selecting the particle sizes and then combining these sizes in proper proportions. These bricks, both chrome and magnesite, have given very good results in service, and particularly in resistance to spalling. Another recent development is the new magnesite refractory developed by Professor McCaughey, and made from the mineral brucite found in Nevada. This mineral when calcined gives a nearly pure magnesium oxide. With proper additions and firing, a calcium ferrite-bonded high magnesia refractory was made of approximately the following composition: Silica, 2.5 per cent; ferric oxide, 7.0 per cent; alumina, 1 per cent; lime, 10 per cent, and magnesia, 79.5 per cent. A carload of this material has been tried out. It is said to produce a dense monolithic hearth of high magnesia content, with a very high resistance to iron-rich slags. No slag is mixed with it, and it frits into place in the open hearth quickly and well. This development promises to supply another domestic source of basic refractory in addition to that found in Washington.

Considerable improvement has been made recently in the field of soaking pit and reheating furnaces. Indeed the whole field of development in the heating of steel whether for rolling, forging or heat treating could be made the subject of a long paper. An interesting innovation is the circular soaking pit now installed at a number of steel plants. One of these pits, with the cover removed, is shown in Fig. 1.

Modern control apparatus is provided which gives exact ratios of the fuel and air used in the furnace. A record is made during operation, and reproduction of given conditions is possible. Heat is furnished by 15 small burners, which, together with accurate values and premixers, give a suitable atmosphere at all rates of firing. Usually a small amount of combustibles is maintained in the waste gases, and scale on the ingots is kept to about half of usual practice. The combustion chamber is formed by sloping walls behind the ingots. The burners fire into this chamber at an angle of about 38 deg. so that there is vigorous recirculation of the hot gases within the furnace and around the ingots, and down through a central flue. The temperatures desired are maintained by means of pyrometer control. Altogether this is a very promising development of a furnace without regenerators or recuperators, using by preference a mixture of coke oven and blast furnace gases, and applying to this important part of steel plant operation the automatic controlled operation used for many years in small heat-treating furnaces.

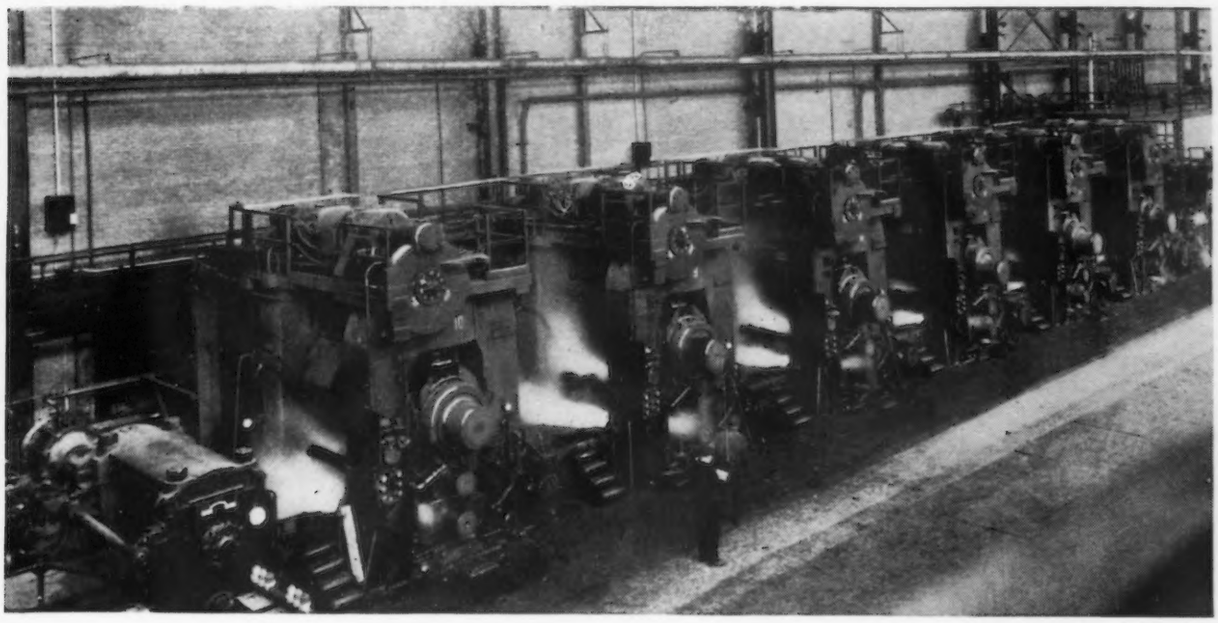

FIG. 3—The finishing train of six rolling mills and a scale breaker in action, with strip simultaneously engaged in all six.

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In all heating furnaces considerable attention is now being paid to control of the furnace atmosphere. This has required and still requires a great deal of research work regarding the nature of scaling, the various oxides that are formed, and methods to limit or to prevent scale formation. The lead in much of this research work has been taken by English and German workers. As a result of constant effort along practical lines, workers in this country have arrived at many furnace designs, for heating steel for forging and rolling, that deliver steel with a very small amount of scale, and, in heat treatment work, bright annealing is being carried out successfully in many plants.

Mention should be made of the continued careful study of fuel requirements in the iron and steel plants. More attention than ever is being given to the cleaning and storing of blast furnace gas, and the proper use of blast furnace gas

(CONTINUED ON PAGE 124)

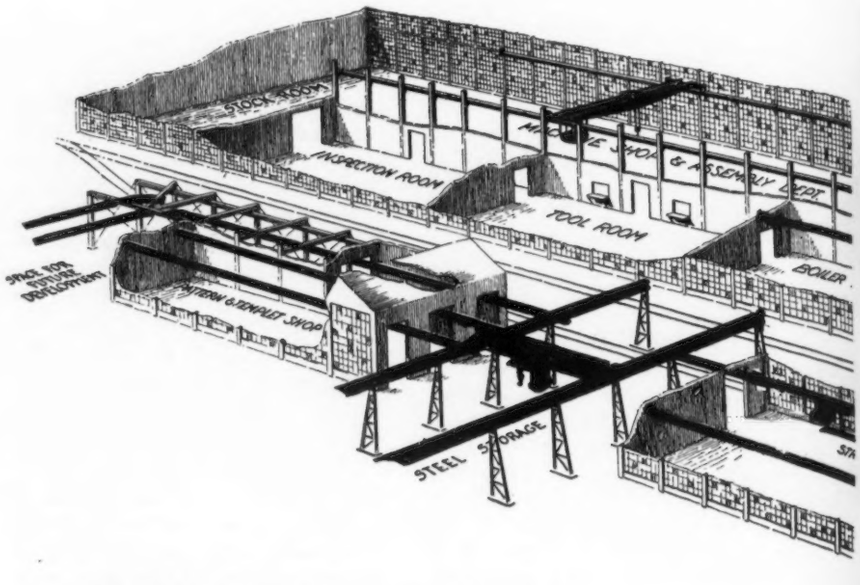
Planning Overhead Handling

IT has been said repeatedly by various authorities that "Moving is 90 per cent of making," and that "The biggest cost-savings of today and tomorrow are likely to come from planned moving, rather than from making." To these statements there may be added the observation that the savings made by substituting mechanical handling methods for manual handling methods cannot be gaged merely by the extent of payroll reductions. While it may be true that some low-priced labor is rendered unnecessary when mechanical handling equipment is installed, the big savings come in the release of high-priced machine operators for more work of a productive nature instead of so much manual effort, thus making for better quality and quantity of goods manufactured, in the closer coordination of processes and the consequent speeding up of production, and in the elimination of the losses caused by the time and effort required for unnecessary rehandling.

Some years ago the first argument used by any salesmen of materials handling equipment was, that his devices would replace the labor of so and so many men. This was undoubtedly true at the time, for little attention was paid to using such equipment as a functional part of a system of materials handling. Then various items of equipment were brought together, such as industrial trucks, conveyors, overhead tramrail systems, hoists and cranes, and welded into comprehensive and coordinated systems for moving materials progressively throughout a series of manufacturing operations. The equipment so used thus became a tool of production, as much as any machine or piece of process apparatus. At this point the labor displaced became only a minor argument because, in making the mechanical handling equipment a tool of production, production processes had to be keyed into the moving of materials.

I am *not* reversing the proper order of statement here. Formerly the moving of materials was keyed in as best might be to the production processes. Now the major emphasis was shifted (because *making* had attained a high degree of efficiency, but *moving* was still in a primitive state of development) to the idea of a continuous flow of materials and parts from the beginning to the end of a manufacturing process; with the result that, for the first time, the process was keyed to the exigencies of the materials handling problem.

Here was a truly revolutionary idea. In the past few years, led largely by the example of the automobile production line, it has swept American industry from Maine to California. And one of the surprises which have come to light in its adoption has been, not technological unemployment, but production cost-cutting through more natural coordination of manufacturing processes, the elimination of wasted time and effort, and a striking increase in the quantity and quality of the goods produced. The far-reaching effect of studying the processes of manufacturing as functions of the movement of materials from raw state to finished product has advantageously affected operating costs in every department of many of the country's largest plants.



SHEPARD - NILES shows a typical scheme of comprehensive overhead handling to serve several departments of a metal working plant.

for Economy

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

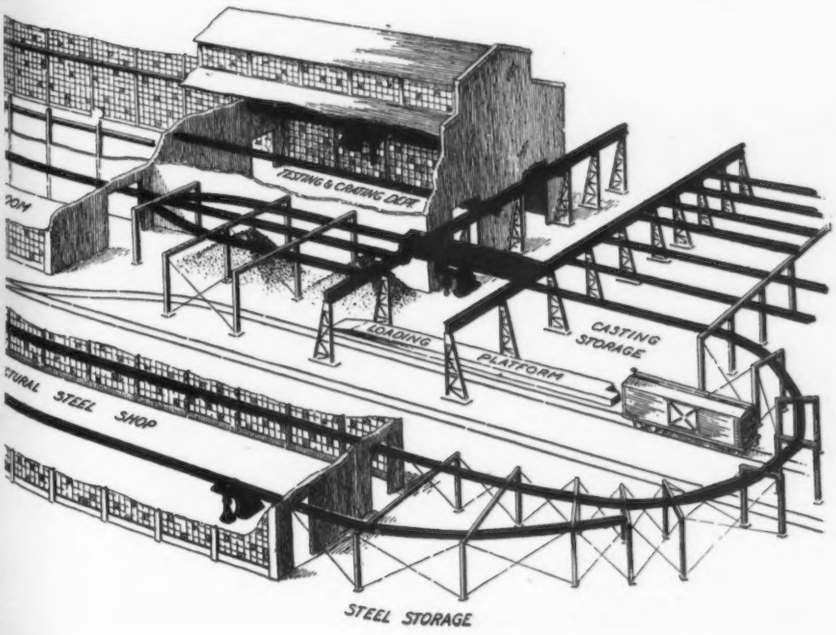
The new conception of mechanical equipment as a *system* of materials handling has changed the basic idea of the function of such equipment from *labor-displacing* apparatus to *production-aid* apparatus. In this new conception there are two vital principles involved. When planning any *system* of materials handling these principles should be recognized and accorded consideration from every point of view.

Two Vital Principles

Credit is cheerfully rendered, for many of the fundamental ideas included in the following discussion, to Cleveland Tramrail Division of the Cleveland Crane & Engineering Co. Basing my premises largely on an analysis of systems planning made by that company, I shall, in this article carry the argument to a conclusion which fits today's manufacturing procedures.

In general, aside from the functional classifications into which all mechanical handling equipment may be arranged (*lifting, shifting,* and combined *lifting-and-shifting* operations, see "Materials Handling as a Factor in Economic Production," THE IRON AGE, Dec. 10, 1936), such equipment as is used in the manufacturing plant may be further classified for convenience in the study of operations, as floor equipment and overhead equipment.

Under the heading, Floor Equipment, should be listed all apparatus that works from the floor as a base. This includes the whole family of hand, lift and self-powered trucks and tractor trains, including stackers or tiering machines; most of the family of conveyors, including belt, slat and roller conveyors of both gravity and power-driven types; floor-supported chain and wire mesh conveyors, vibrating screens or tables, screw conveyors and chutes of all types. The common characteristic of all the equipment in this classification is the necessity of setting aside floor space which might otherwise be used for manufacturing processes, for handling operations.



Under the heading Overhead Equipment should be listed all apparatus that works from the ceiling, or from overhead-supported structures, as a base; as cranes, hoists, tramrail or monorail, overhead chain conveyors, and pneumatic tube system. The common characteristic is, free floor space.

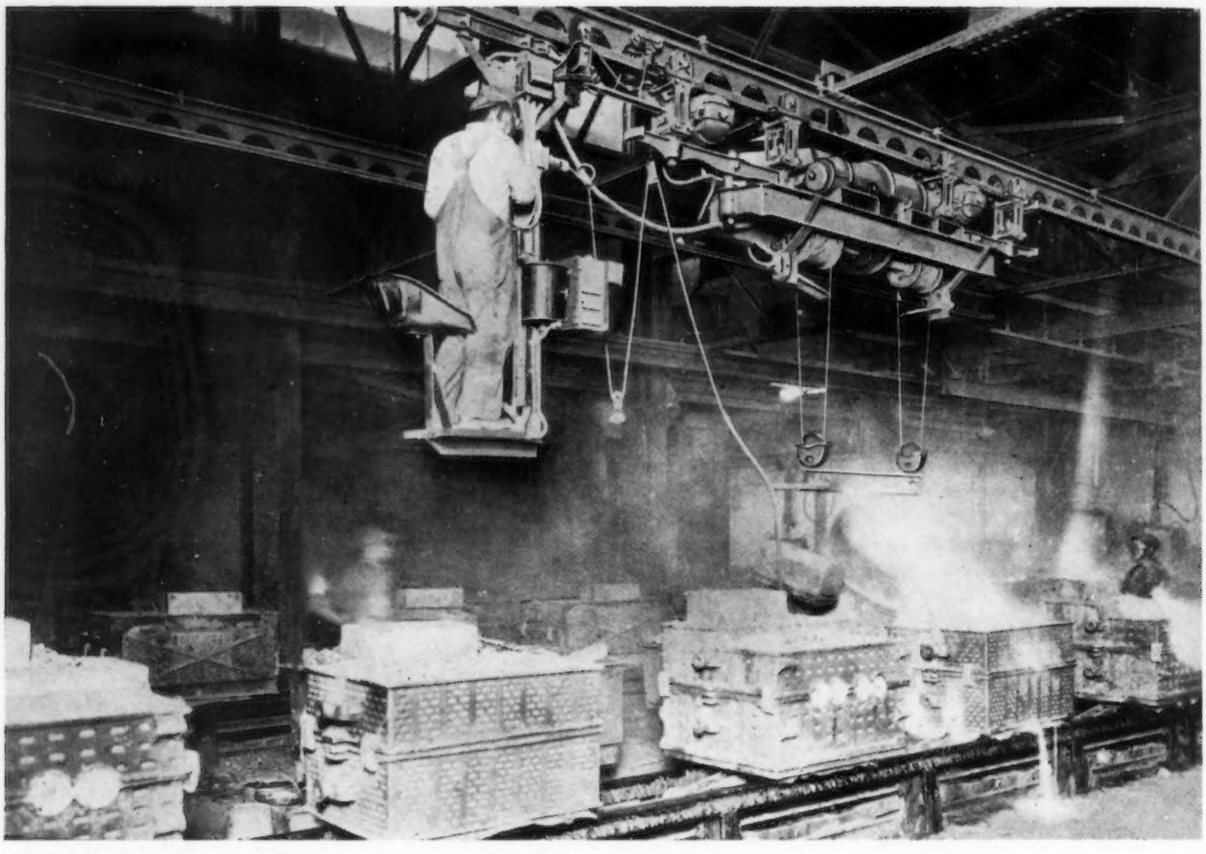
Any and all of these items of equipment may be fitted into a coordinated system of materials handling to perform either or both of two types of work, as judged from the accounting point of view; (1) Moving materials to and from storage, either permanent or temporary, and (2) Moving materials to and from processes in the production scheme. The first type of work may be termed a "warehousing" job; the second a true "production-aid" job. It is important to bear this job distinction in mind, for warehousing is a non-productive item of costs and production aid is (or should be) a productive item of costs. The first should be planned as a necessary evil to be avoided as much as possible; the second as a pace-maker to speed production.

With these preliminary considerations in mind, it is possible to analyze the successful functioning of any *system* of materials handling equipment. The basic principles are but two in number:

A. The load should be picked up and taken to its logical destination directly, without rehandling.

B. The size of the unit load handled should be proportioned to the economic possibilities of the machine or process to be served, or the storage facilities available.

While these principles are perfectly general, and apply to any system of materials handling in the



MOTOR-DRIVEN ladle carrier on a Cleveland Tramrail overhead system serving a foundry. Metal is carried from the cupola and poured direct without any rehandling. The operator rides with the load.

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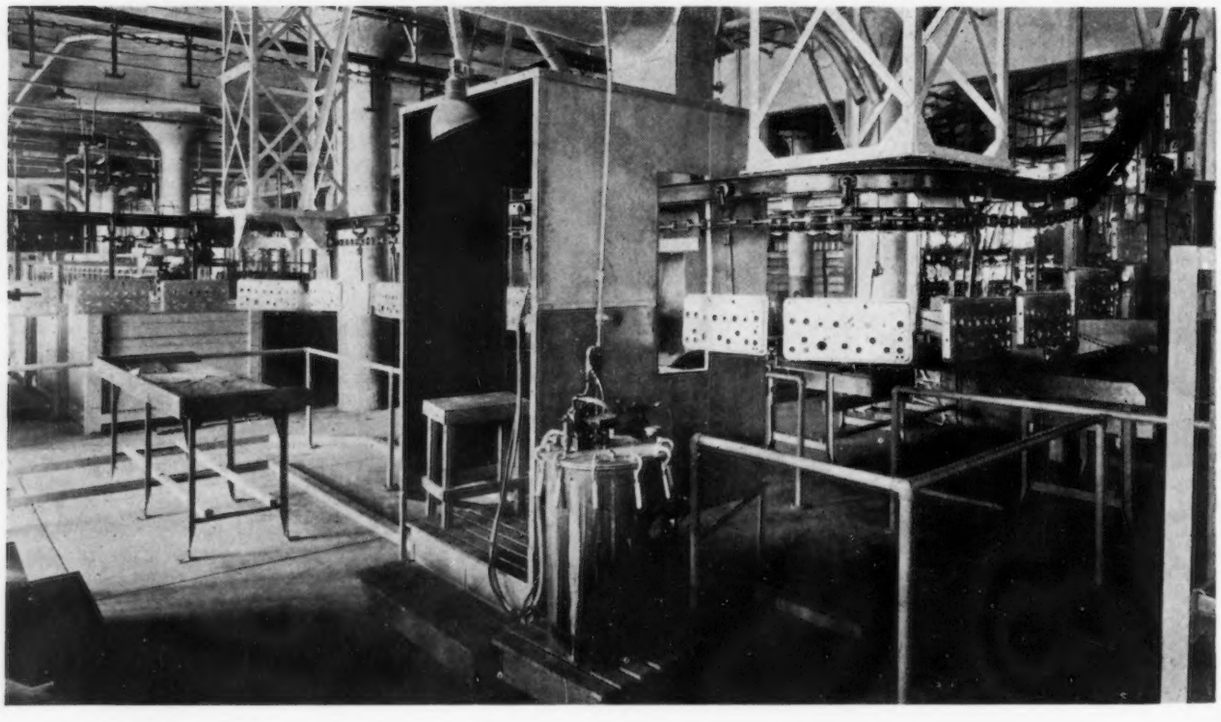
AMATHEWS overhead chain conveyor carries parts continuously through a paint-spraying booth and on to the next assembly operation without rehandling.



manufacturing plant, the following discussion, broken down into eleven points for the sake of clarity, covers their application to the planning of an overhead system of handling designed to effect maximum production economies.

The Principles Applied

Broadly, there are two main operations involved in the movement of commodities or materials. The first is "handling" in the strict sense of the term—picking up and setting down. The second is "transportation," or the actual movement of the load from where it is to where it is needed. Many types of mechanical handling equipment do not perform both functions. They require manual "loading" or manipulation of some kind involving physical effort. Since the labor costs of "handling" generally far outweigh the mechanical costs of "transportation," it is necessary to consider, when planning a materials handling system designed as a production aid, the effect of these costs on the final cost of production, and to weigh them carefully against the price of the use of equipment which combines both handling and transportation in one continuous operation.

Further, all floor operated equipment takes up space which may be considered to be more valuable from a manufacturing or storage point of view than as space to be occupied by handling equipment. And the cost of maintenance of floors used by trucks must be weighed against the cost of installing and maintaining overhead equipment.

These and other factors will be made clear in the following analysis of the advantages of an overhead system of handling.

1. *The original lift and carry operation should be complete in itself.* With slat, belt, or roller conveyors and with hand trucks or the non-lift types of powered trucks, some one must place the material to be handled on the transportation equipment, and take it off again. With hand-powered lift trucks and skid platforms some manual effort is required to pick up the load and to push or pull it to its destination. Lift type power trucks and overhead handling equipment however may be arranged to perform a complete transfer operation, thus cutting labor costs to the bone.

2. *Rehandling should be eliminated.* Whenever, for any reason the transfer of the load is interrupted between its point of departure and its logical destination, and the load is set down, then picked up again, or taken from the original carrier and placed on another carrier non-automatically, rehandling occurs. All rehandling is costly, and should be avoided. Overhead tramrail or monorail systems may readily be arranged to permit the original carrier to be switched from one line to another, or to be stored temporarily on a spur track, thus avoiding rehandling. Likewise such systems can be arranged to permit the original carrier to handle the load through a progressive series of processing operations without rehandling.

3. *Proportion the size of the unit loads to the economic requirements of the case.* A machine or piece of process equipment will accommodate a given quantity of material at one time. The speed of operation of the load requirements of such apparatus will then determine the economic load to be delivered to or taken away from it. The nearer the capacity of the handling equipment comes to handling that size of load at one time, the more closely coordinated will be handling and processing, and generally the lower will be the costs of handling. Conveyors of all types deliver loads in a continuous stream, so that speed of operation of the conveyors may be regulated to suit such economic requirements. For other types of handling equipment where the transfer depends on a back-

THE monorail trolleys of these Shepard-Niles cranes can run off the cranes onto overhead track systems to deliver their loads at any point around the plant as desired.

and-forth movement of carriers the problem becomes one of proportioning the size or capacity of each carrier and its speed of delivery to the requirements of the machine.

4. *Increase the size or speed of delivery of the unit loads.* If a machine or piece of process equipment accommodates X number of pieces of size A in one operation, consider the effect of increasing the size of each piece, or the number of pieces worked upon in that operation. Generally a well-planned materials handling system has a capacity for delivery of loads far in excess of the capacity of the machines it serves, and may easily be speeded up or carry larger loads if the apparatus served is capable of absorbing them. This is particularly true of conveyors and overhead tramrail systems. Weigh the costs of utilizing the handling system to its full capacity against the costs of increasing machine productivity.

5. *Lessen the non-productive time of machine runs.* Many production machines, designed to operate at maximum speed and capacity, cannot operate at the point of greatest efficiency because time must frequently be taken out to set them up for new runs. But a handling system which will deliver larger unit loads, or the same unit loads with greater frequency, may often make possible an increase in the size of the unit of production on the machine, and thus cut down the time lost in new set-ups.

6. *Avoid damage to materials or product in transit.* Consider carefully the possibilities of damage which may be caused by the various methods of picking up and transporting the materials or product. Among all the hundreds of carrier accessories available, there is at least one which will meet all the needs of the problem with safety all around.

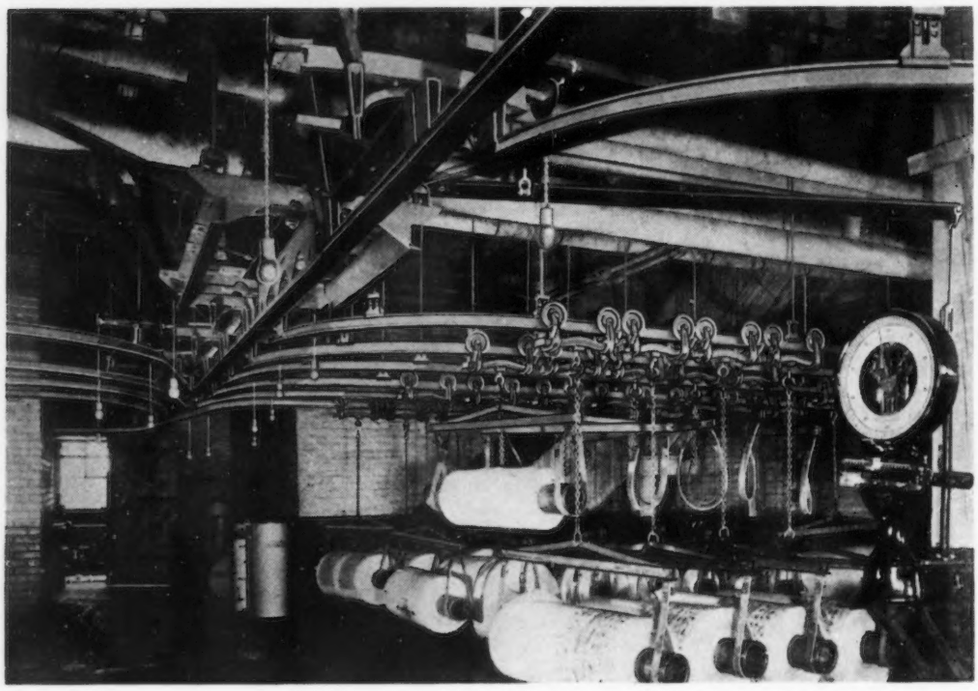
7. *Handled-through processes speed up production.* Many types of progressive processing can be expedited by a handling system which moves the load in one carrier through the various processing stages progressively without rehandling. Overhead tramrail systems are admirably adapted to such work.

8. *Increase production per man.* By putting materials or parts within the natural reach of the operator tending a machine or piece of processing equipment, so that he need not turn, stoop or bend to lift them into place, he is frequently enabled to operate his machine more continuously and productively. An increase in production per man decreases the unit cost per piece produced.

9. *Release men for productive labor.* Where useless manual operations have been eliminated by the employment of mechanical handling equipment, the men formerly performing such manual labor may be set to productive work.

10. *Increase speed of handling and conserve human effort.* This may be accomplished by speeding up the machinery of production, by the elimination of rehandling, or by both. In all cases, by eliminating such manual labor, human effort is conserved for really productive work.

11. *Set a pace for production.* It is clear, from the foregoing, that the well-designed materials handling system, properly coordinated with the various production processes of the plant, becomes in effect a pacemaker for those processes. It permits production to be carried on at the point of greatest efficiency; at the same time conserving the human effort involved. Thus both unit costs may be decreased, and quantity of product increased without affecting total labor payrolls.



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REHANDLING is eliminated by this Cleveland Tramrail system. Waxed paper is handled from the winder, printer, waxing machines and stored, continuously. Note the spur tracks for temporary storage.

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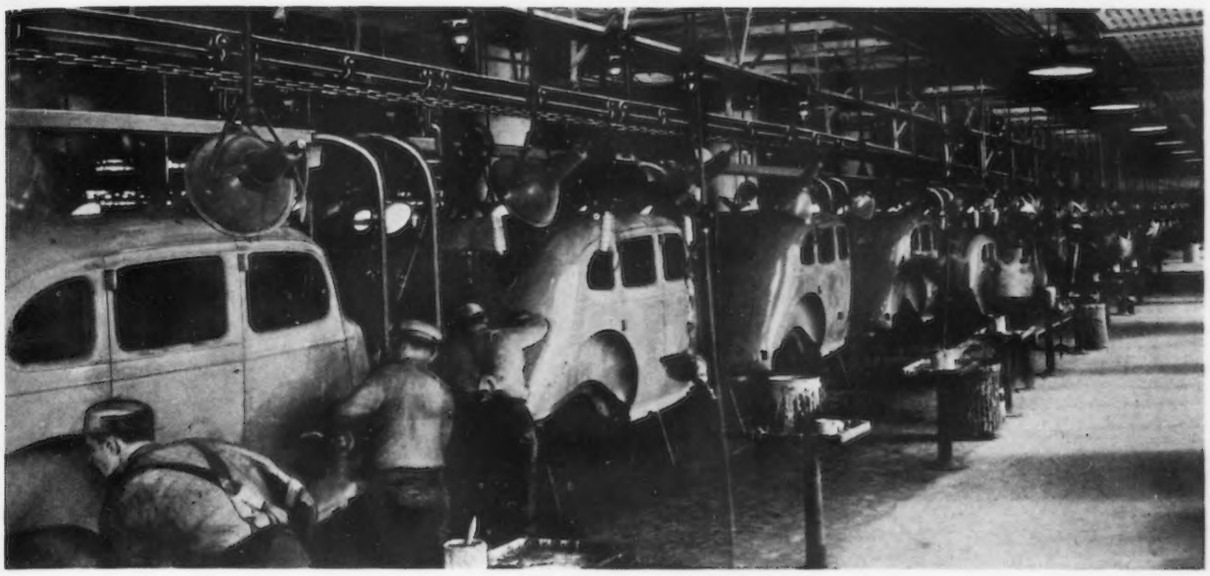
Design Considerations

In the actual design of a complete materials handling system it is advisable to make a careful analysis beforehand of the various use factors involved in the operation of the system. Here is a suggested outline for such an analysis:

If the use of the system is to be



A MECHANICAL Handling Systems, Inc. Monoveyor carries automobile bodies through various finishing processes along the assembly line.

as warehousing equipment, determine

a—The nature of the commodity or materials to be handled.

b—The size, shape, weight, quantity, relative fragility, etc., of the commodity or materials to be handled, and the type of carrier best suited to handle it.

c—The amount to be handled in a given period, in pieces, or by weight.

d—The space available for handling, distances to be moved, route of travel, physical obstructions in the way, etc.

e—The type of handling equipment best suited to perform the work.

If the use of the system is to be as a production aid, determine

o o o

a—All the facts listed under "warehousing" above, and,

b—Plan the processing sequence of operations and the best routing thereof.

o o o

A AMERICAN MonoRail system conveying range parts from spray booths into drying ovens. Loads enter one end and are taken out of other end of the ovens.

c—Determine the most efficient cycle of operations.

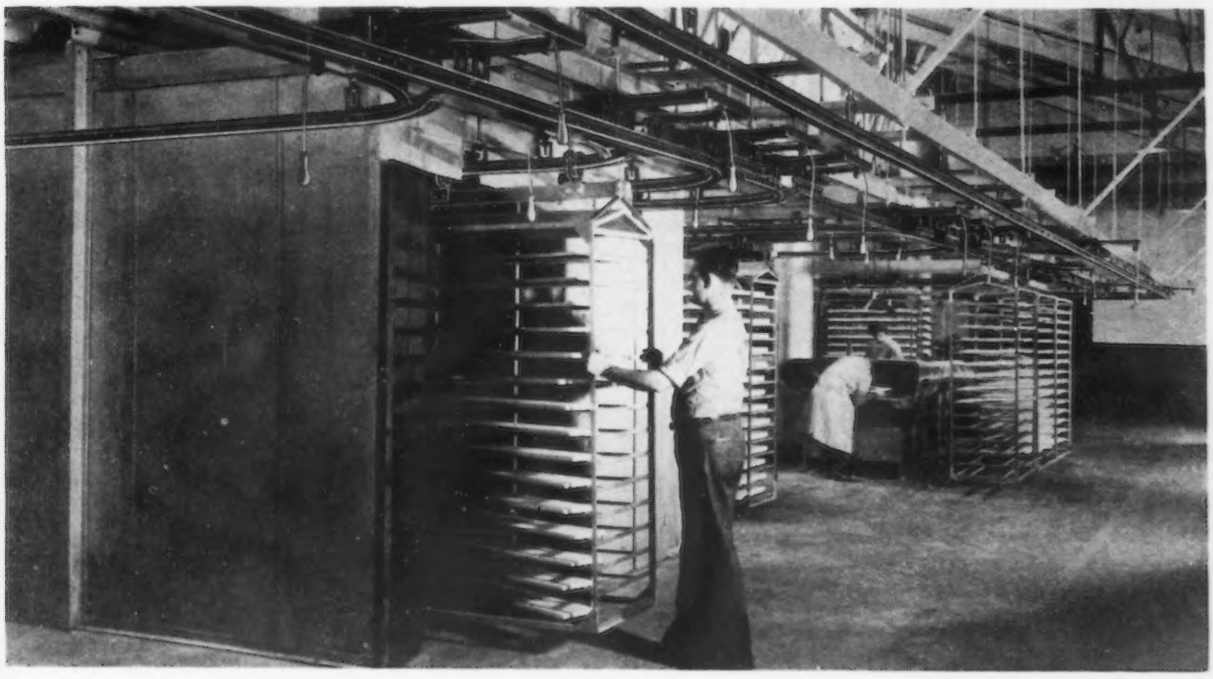
d—Reduce the lines of travel to a minimum.

e—Coordinate the flow of minor and sub-assemblies.

f—Study the best locations of receiving points, stock rooms for raw, processes and finished stock, and outloading points for docks, cars or trucks.

g—Fit the program not only to present needs, but, so far as can be anticipated, to future requirements.

The illustrations published with this article have been selected to show the application of many of these points to overhead handling equipment of various types.



Develops Hardening Machine for Double Helical Gears

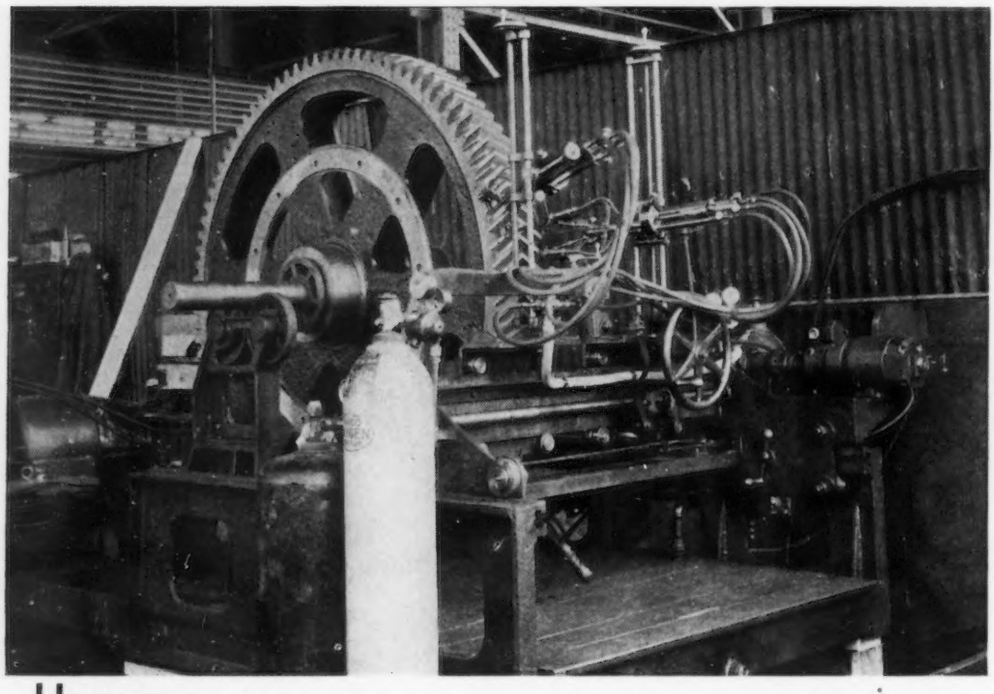
THE Farrel - Birmingham Co., Inc., 344 Vulcan St., Buffalo, is offering a torch hardening machine especially suitable for hardening double helical gear teeth. The machine has been under development for the past four years and is the result of the collaboration of the research departments of Farrel-Birmingham and of the Air Reduction Sales Co. who supply the gas hardening tips.

Selective hardening, by means of an oxy-acetylene torch, of surfaces made in steel was practiced to some extent as long as 30 years ago. It was a toolmaker's method of hardening the edges of sheet steel contour gages. The first application of this method consisted of holding the piece of metal in water in such a way that the surface to be hardened was submerged to a depth of approximately 1/16 in. Flame projected onto the metal surface blew the water away and heated the metal, which was immediately quenched upon withdrawing the flame.

About 20 years ago Sumpter in England developed the same idea to make it applicable to the hardening of the surfaces of gear teeth. He devised a torch to which was connected a pipe which impinged a stream of water onto the surface adjacent to the flame. This device was traversed by hand and in the hands of a skillful worker passable results were obtained. About 10 years ago A. E. Shorter in England developed a machine for mechanically guiding a torch fitted with a water jet and thus obtained more reliable and uniform results. Shorter's torch, or flame hardening method, permits the hardening of the tooth surfaces without appreciable distortion. When properly carried out, it is very successful for relatively coarse pitch teeth. It can be applied to teeth of pitches from 6 DP to 1 DP. It can also be used for finer pitch teeth, but since such gears are usually of small enough diameter to be hardened in a furnace without great distortion, its range of usefulness seems to be for gears of 6 DP and coarser pitches.

The Farrel - Birmingham gear hardener works on the Shorter principle, and the Airco tips have both heating and quenching holes with gas and water connections. The tips are mounted in pairs in an adjustable yoke so as to heat both sides of a gear tooth simultaneously. For double helical or herringbone gears, there are two separate torch heads, each carrying two separate sets of tips. Support of the gear is by an arbor rotating in two sets of anti-friction trunnion rollers, which make a flexible arrangement for a wide range of arbor diameters.

Each head carries two sets of torches, or tips, so that both sides of a tooth are hardened simultaneously. In operation, one torch head starts hardening at one end of the tooth and the other torch head at the other end of the tooth. They each travel toward the center, or apex, of the teeth. Their traverse is horizontal, but a guide roller, fixed on the torch saddle, or carrier, engages the gear being hardened between two teeth and thus revolves the gear in correct relationship to the horizontal traverse of the torches. The helical trace of the teeth is therefore, in effect, followed by the torches without the necessity for any complicated mechanism. The guide pin, or roller, referred to, is



HERRINGBONE teeth on this large hoist gear are being hardened by the flame and quench method.

supported by a bracket attached to one traverse saddle of a torch head. It also acts as an indexing finger.

The rate of travel of the torches with the attached water jets can be regulated by turning the handwheel of a variable speed gear. The usual rate of traverse is from 6 to 10 in. per min., varying with the size of tooth to be hardened.

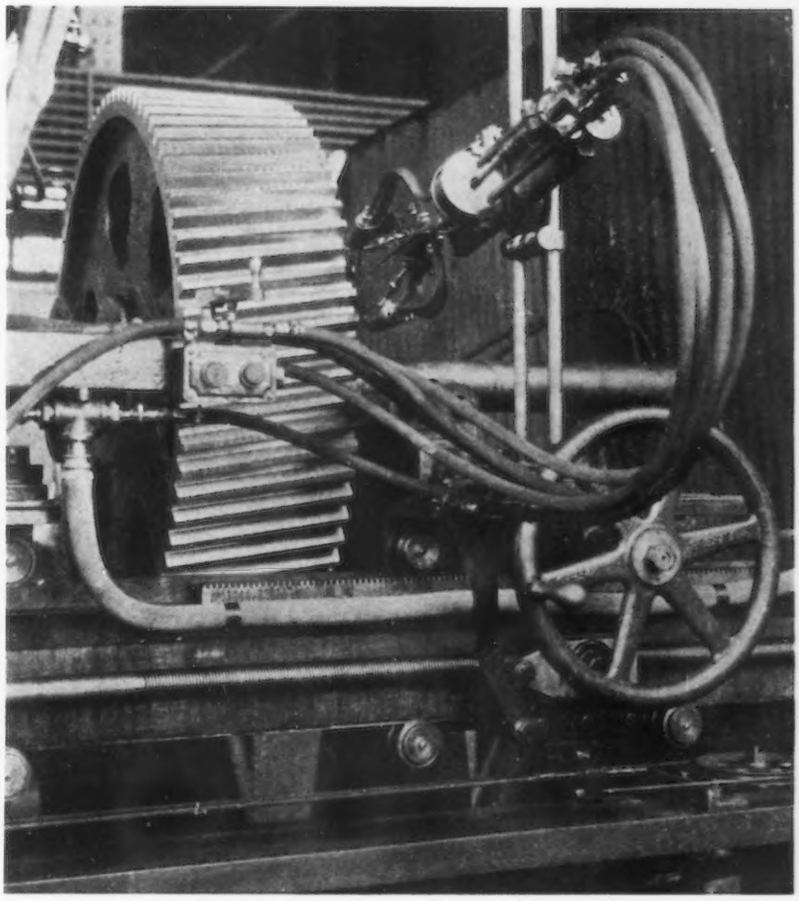
Each torch head is also fitted with a pilot light for igniting the main torches. This pilot light, together with the gas supply to the main jets, or torches, is controlled by one lever.

To obtain the desired hardness and the desired depth of hardness as well as uniformity, exact adjustment of the tips and of the water jets are provided. It is claimed that, due to considerable research work, great economy in gas consumption has been obtained.

Wide Range of Applications

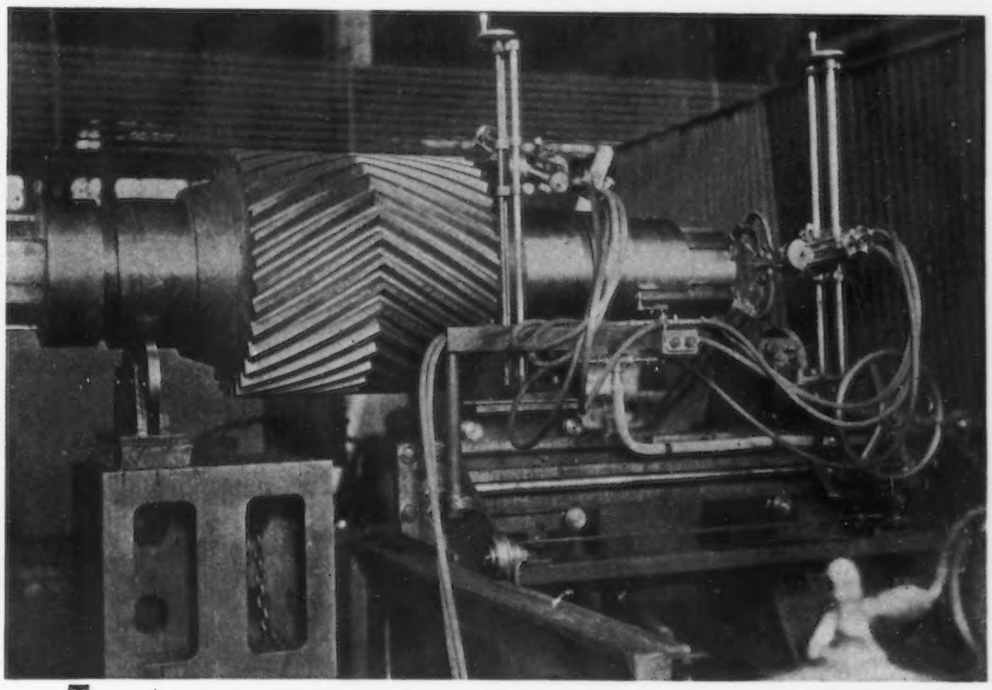
Although the machine has been designed especially to harden double helical or herringbone teeth, it is equally suitable for hardening single helical or straight tooth gears. It will also harden splines or rolling mill wabblers as well as sprocket wheels or any other similar type of article. The maximum capacity of the machine is a gear of 84 in. in diameter and 24 in. face. The overall dimensions are 6 ft. 8 in. wide x 9 ft. 6 in. long. The water tank, forming the base of the machine, has a capacity of 250 gal. A centrifugal motor-driven pump is provided with a suitable relief valve and other necessary fittings so that the water pressure is kept constant and of the correct volume. It has been found that the water pressure from city water mains is not sufficiently uniform.

Seven different sizes of tips, or burners, are suitable for the whole range of work. These are easily and quickly placed in position.



CLOSE-UP of the yoke carrying the two tips for hardening both sides of a tooth at the same time.

U. S. Patent No. 2,067,549 has been issued covering the new features of the machine. Other patents are pending, relating to the torch adjustment features and the control valves.



THE machine can be set up for hardening the splines on the end of a rolling mill pinion.

Replacement Grinding Wheel Head

A SELF - CONTAINED independent grinding wheel head unit with all its movements and controls within itself is being offered by the Fitchburg Grinding Machine Corp., Fitchburg, Mass., so as to make automatic cycle grinders out of plain cylindrical machines. The "Bowgage" head has rapid traverse, feed, dwell and rapid return to starting position, all actuated by a single push button.

Rate of feed is controlled by a hydraulic metering valve through a dial on the panel. The dwell time is governed by a Telechron clock-controlled time-delay switch. Another graduated dial, operated by a small handwheel, can be set for the amount of stock removal, with a maximum of ⅛ in. on the diameter. The rate of rapid traverse is constant and the amount is set at the factory anywhere between 0 and 5 in.

The principle of this wheel is a toggle, in the form of a leaf spring. The spring is located horizontally between the wheel head and the wheel head slide. One end is attached to the slide and the other to the head, under tension and in a bowed position when the wheel head is at the start of the feed. By a hydraulic piston moving vertically the leaf spring is flattened out, and the elongation produced results in the wheel head moving forward for the feed.

This feed motion is relatively fast at the start of the feed and gradually slows down at sizing position. In fact, as the wheel is moving into the final sizing position the ratio of the vertical movement to the horizontal feed movement is approximately 250 to 1. The feed movement may therefore be controlled within ten thousandths of an inch and because the spring is solidly fastened at either end, no back-lash can occur, thus contributing further to the accuracy of the unit.

The head is built for either right or left-hand wheel mounting and since the unit is independent, it may be placed anywhere on the machine. The cycle time can be varied from 5 sec. to 30 min. A 3 to 10-hp. motor is required depending upon the wheel size which may vary from 20 in. diameter to 4 in. face to 24 in diameter by 2 in. face. A laterial wheel spindle feed can also be furnished.

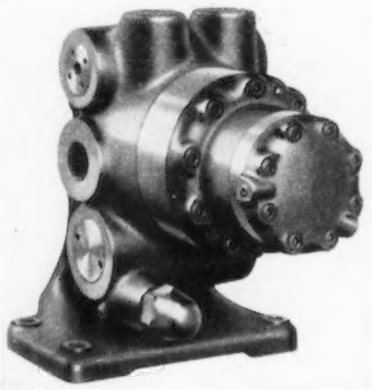
Improved Rotary Gas Carburizing Machine

THE American Gas Furnace Co., Elizabeth, N. J., announce numerous improvements in its 600-lb. capacity rotary carburizer, which is now known as the No. 2-B'37. The machine has an improved lining consisting of insulating refractory backed by block insulation which gives much lower gas consumption. The burners are of heat-resisting alloy and fire into special high-temperature refractory burner tunnels, thus insuring long life. These burners fire from one side of the machine only, giving a flame which sweeps entirely around the retort with uniform heating at all points. The burners are graduated in size to insure uniform heating throughout the entire retort length, despite the greater radiation losses at the ends. The burners are served by a single valve control set using air at 1 lb. per sq. in. and gas at 4 to 6 in. water column. This machine is also supplied for high pressure gas where desired.

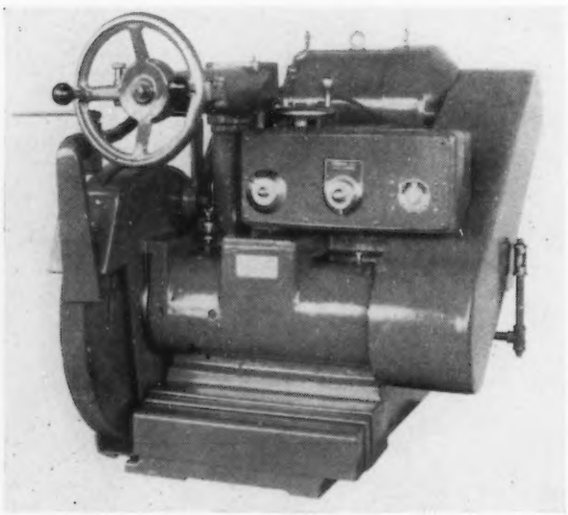
A simple crane is supplied for handling the cover. The cover itself is of improved design with insulation extending to the inner heat-resisting alloy spacing disk.

Oil Hydraulic Pump Unit

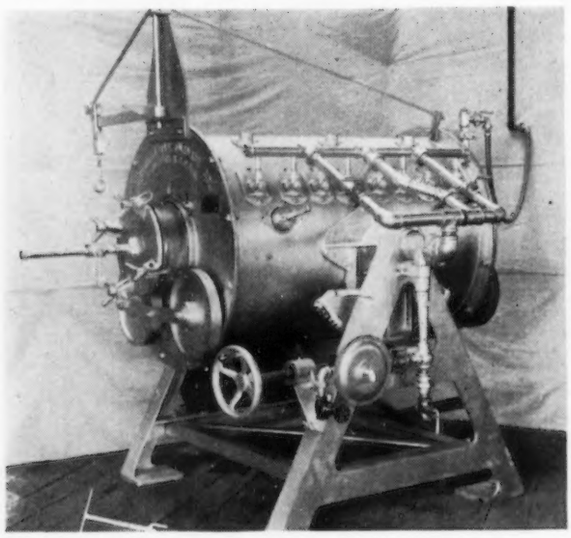
THE Sundstrand Machine Tool Co., Rockford, Ill., announces a line of WX model pump units, which are especially designed for arbor presses, clamping fixtures indexing



PUMP for arbor presses, clamping fixtures, indexing devices, clutches, brakes and the like.



SELF-CONTAINED grinding wheel-head designed to make automatic cycle grinders out of plain cylindrical machines.



ROTARY carburizer with improved lining and heat resisting alloy burners, the latter arranged to fire from one side.

devices, clutches, brakes, and the like. The units are built in several sizes.

Quick action for the approach and return of a ram or clamping member is taken care of by a large capacity Sundstrand Rota-Roll pump, with a small-sized pump of the same type producing the clamping or working pressure. Only the output of the small pump is bypassed against the working pressure. All control valves and the two pumps are contained in one housing and operated by a remote pilot valve which may be manually or automatically controlled.

Both of the pumps are mounted on the same shaft, driven at motor speed of 1200 r.p.m. The unit can be supplied with either foot or flange mounting. An oil reservoir with motor base for attaching a foot mounted unit can also be furnished, together with any type of remote pilot valve desired.

Automatic Molding Machine Has Many Features

IN modern mass production foundries, the handling of flasks, sands, finished molds and castings, has shown rapid strides of progress mechanically. Molding machines have lagged somewhat in this procession insofar as many types of molding machines today must be operated with considerable physical effort.

This new 18-44-TYPE-OE molding machine, made by Wm. H. Nicholls Co., Inc., Richmond Hill, Long Island, N. Y., is designed for use in the continuous conveyor system of the mass production foundries. It is a combination jolt and power squeezer with a pattern drawing device and has an adjustable flask rolloff.

After the operator has placed the flask in position on this machine, his only concern is to fill it with sand from the hopper. All movements are governed automatically by an air-operated main valve. The machine stands still for an adjustable period to permit the operator to place the flask and open the sand gate; then it starts jolting. A jolt counter shuts off the jolt air line after a certain number of strokes. This number can be set anywhere between four and 12 to fit sand conditions.

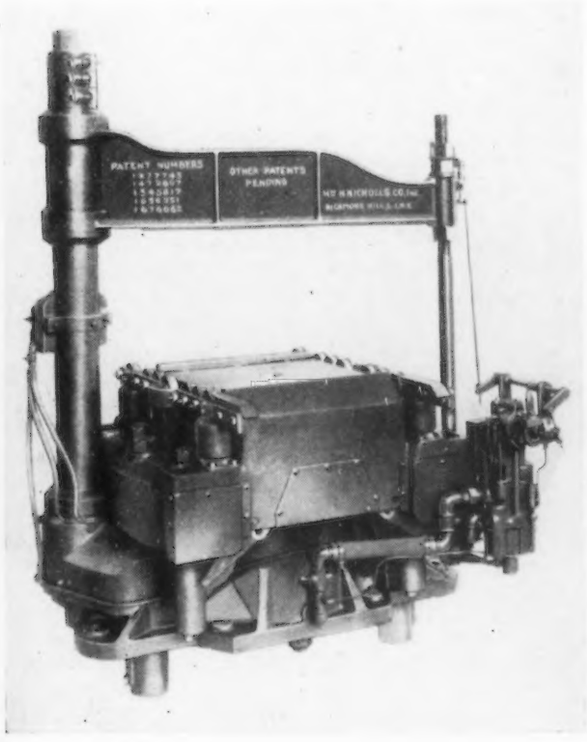
As soon as the jolting ceases, the squeeze head swings in automatically. It is interlocked with the main valve in such a way that the valve turns to squeeze as soon as the squeeze head is in position, but never before. The squeeze piston lifts the mold, pressing it against the squeeze board. As soon as the cylinder has reached proper pressure, the main valve turns back to neutral. The squeeze piston goes down with the pattern plate while the lifting frame carrying the mold remains supported by latches, thrown in by air.

Toward the end of the pattern draw, wheels rise from the machine under the ends of the flask, raising the mold level with a wheel conveyor behind the machine. The finished mold is pushed off on to this conveyor. At the same time the cross arm automatically swings back for the next cycle.

When properly supplied with sand and empty flasks the machine will deliver finished molds to the mold conveyor at a rate of three or four molds per minute, depending on conditions.

Liberal adjustments have been provided everywhere so the timing of every operation can be varied to suit conditions. The rolloff device has also been made adjustable not only as regards the height of the lift as before, but also as to the length of the flasks used.

The machine is solidly built and provided with a pressure lubrication system. All working parts are fully covered and protected against sand and dust. Special pains have been taken to provide a precise pattern draw through the use of four hardened steel pins working in hardened bushings, all immersed in oil and protected by telescope covers. Only at the end of the pattern draw when the pattern is already clear of the sand, is the flask lifted by means of the rolloff device.



NEW molding machine for use in continuous conveyor system of mass production foundries.

Machinery Industry 1935 Census

WASHINGTON, May 25.—Rising 93.8 per cent, the 1935 value of machinery, not specifically assigned to other industry classifications, was $523,430,492, f.o.b. factory prices, compared with $270,092,929 in 1933, according to the Bureau of the Census. The industry employed 109,818 wage earners in 1935 and expended $131,742,637 in wages. The largest item in the report is metalworking machinery with a total value for 1935 of $53,887,585, an increase of 298.3 per cent over 1933. Of this total, over one-half, or $29,294,890, was the value of rolling mill machinery. This represents an increase of 557.6 per cent over 1933.

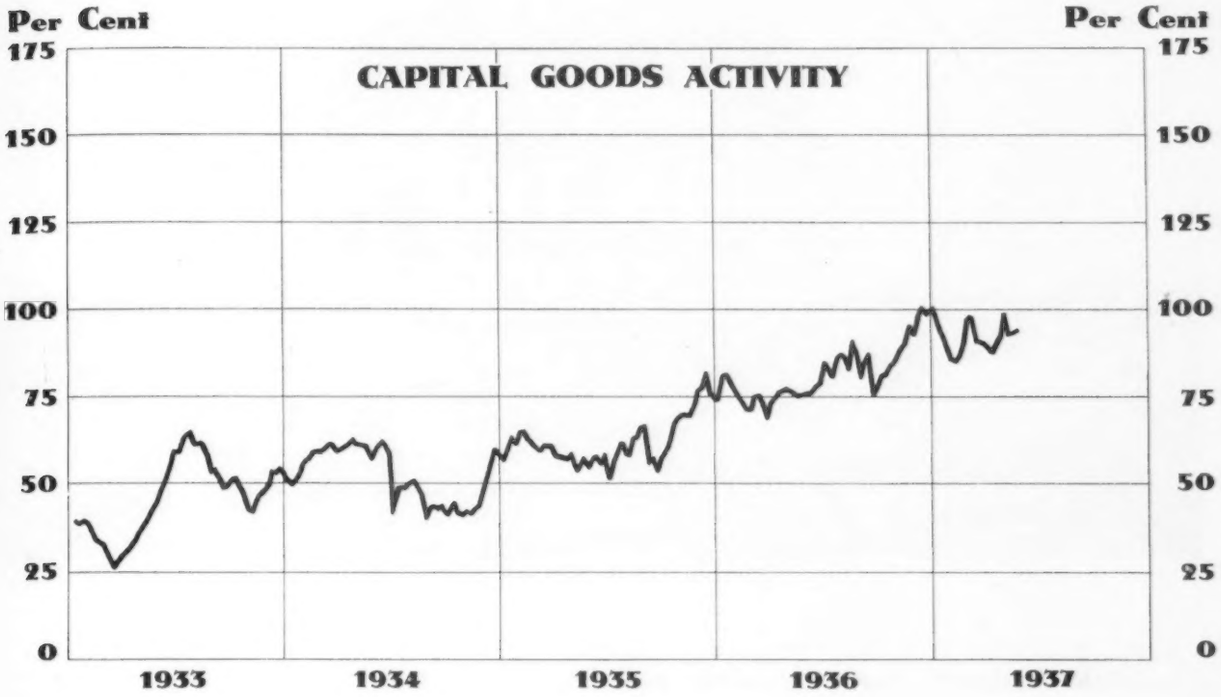
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week.

Raw Materials:	April 1937	March 1937	April 1936	Three Months 1936	Three Months 1937
Lake ore consumption (gross tons)[a]	5,114,177	5,142,496	3,485,293	8,481,741	14,280,114
Coke production (net tons)[b]	.....	4,849,363	3,554,617	10,110,549	13,762,576
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	.....	3,459,473	2,403,683	5,889,902	9,670,191
Pig iron output—daily (gross tons)[c]	.....	111,596	80,125	64,724	107,447
Castings:					
Malleable castings—production (net tons)[d]	.....	67,521	50,954	134,345	133,742
Malleable castings—orders (net tons)[d]	.....	68,525	47,933	130,138	182,782
Steel castings—production (net tons)[d]	.....	.....	63,087	143,926	.....
Steel castings—orders (net tons)[d]	.....	.....	83,188	182,061	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	5,071,875	‡5,216,666	3,942,254	9,352,983	‡14,355,437
Steel ingot production—weekly average (gross tons)[e]	1,182,255	‡1,117,577	151,625	719,460	‡1,116,286
Steel ingot production—per cent of capacity[e]	90.27	‡89.9	69.09	54.93	85.44
Finished steel:					
Trackwork shipments (net tons)[e]	.....	10,720	7,031	13,740	26,119
Sheet steel sales (net tons)[f]	.....	.....	190,269	564,867	.....
Sheet steel production (net tons)[f]	.....	.....	217,975	622,179	.....
Fabricated shape orders (net tons)[g]	.....	182,049	101,614	370,133	401,646
Fabricated shape shipments (net tons)[g]	.....	131,691	124,044	265,885	315,559
Fabricated plate orders (net tons)[d]	.....	68,899	29,900	97,009	139,663
U. S. Steel Corp. shipments (tons)[h]	1,343,644	1,414,399	979,907	2,181,281	3,698,041
Ohio River steel shipments (net tons)[i]	.....	122,100	74,110	196,052	306,670
Fabricated Products:					
Automobile production, U. S. and Canada[k]	.....	*518,715	527,726	1,117,172	1,301,681
Construction contracts, 37 Eastern States[l]	.....	$231,245,900	$234,631,600	$553,973,800	$662,347,200
Steel barrel shipments (number)[d]	.....	995,407	730,099	1,720,572	1,720,572
Steel furniture shipments (dollars)[d]	.....	$2,515,169	$1,633,633	$4,656,391	$6,761,668
Steel boiler orders (sq. ft.)[d]	.....	1,516,128	783,961	2,023,427	3,022,027
Locomotive orders (number)[m]	.....	29	15	73	108
Freight car orders (number)[m]	.....	6,200	3,650	8,913	27,613
Machine tool index[n]	282.5	211.6	125.7	†109.4	†192.4
Foundry equipment index[o]	208.1	293.2	134.0	†117.4	†244.8
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	51,802	49,277	150,567	136,493
Imports of pig iron (gross tons)[p]	.....	10,720	11,982	53,436	34,494
Imports of all rolled steel (gross tons)[p]	.....	31,457	23,847	63,212	89,000
Total iron and steel exports (gross tons)[p]	.....	570,576	301,987	714,777	1,063,255
Exports of all rolled steel (gross tons)[p]	.....	186,531	101,522	237,719	412,186
Exports of finished steel (gross tons)[p]	.....	173,428	90,116	223,318	381,111
Exports of scrap (gross tons)[p]	.....	355,979	190,845	469,366	568,060
British Production:					
British pig iron production (gross tons)[r]	680,700	680,300	629,800	1,813,800	1,934,700
British steel ingot production (gross tons)[r]	1,080,400	1,109,500	*984,200	2,831,100	3,104,300
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	43,642	38,073	105,573	124,729
Lead shipments (net tons)[s]	.....	63,425	40,457	104,419	159,518
Zinc production (net tons)[t]	.....	53,202	43,252	120,209	131,043
Zinc shipments (net tons)[t]	.....	59,635	42,311	124,274	157,815
Deliveries of tin (gross tons)[v]	.....	9,080	6,235	17,755	24,370

* Preliminary. † Three months' average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary from Automobile Manufacturers Association—Final figures from Bureau of Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.



The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	93.7	Same week 1934	59.6
Preceding week	92.8*	Same week 1933	42.9
Same week last month	98.2	Same week 1932	37.4
Same week 1936	75.3	Same week 1931	69.6
Same week 1935	59.6	Same week 1930	101.9
		Same week 1929	126.9

* Revised.

ACTIVITY in the production and distribution of durable goods showed a gain of one point, based on a revised figure for the previous week, according to THE IRON AGE seasonally adjusted index. As a result of the CIO inspired strike that crippled the Jones & Laughlin Steel Corp. for a few days during the latter part of the week ended May 15, THE IRON AGE estimate of ingot production for that week was adjusted downward to 90.5 per cent of capacity, in place of 92 per cent originally computed. For the week ended May 22, the figure is back at 92 per cent. Declines were recorded in heavy construction volume, off 12 per cent but a gain on the basis of the 13-week moving average; and in automobile production, down over 2 per cent because of sporadic strikes in the Saginaw Valley district. The Pittsburgh composite, lagging a week, is also lower, largely as a reflection in the production index off because of labor difficulties, since shipments remained stationary on the index figure. A gain of 6 per cent in carloadings of forest products, plus the gain in steel output, together with seasonal adjustments, tended to offset these losses.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	92.0	+1.5
Automobile production (number of cars and trucks)	136,438	—3,069
Railroad loadings of forest products (number of cars)	39,481	+2,165
Pittsburgh industrial production and shipments (index number)	104.0	—2.3
Construction contracts awarded (total value)	$55,244,000	—$7,457,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

THIS WEEK ON THE ASSEMBLY LINE

. . . Strike-battered auto industry harassed again; union's internal strife plays part in strikes.

o o o

. . . Half a million people left without light or power in Saginaw Valley industrial area during strike.

o o o

. . . Production falls 3000; truck sales for quarter affected adversely in dust area.

o o o

. . . Yale & Towne Mfg. Co. closes Detroit plant to avoid labor problem.

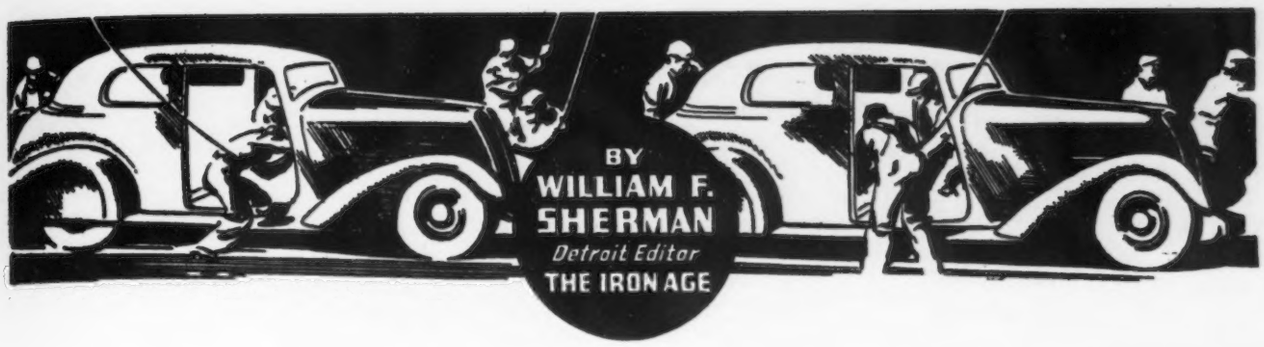
DETROIT, May 24.—After a little peace with automobile workers, the industry again is the plaything of a group of irresponsible minor union officials who refuse to heed either the terms of their contracts or the orders of their superiors in the UAW. Their leadership has precipitated a series of minor and major strikes in the last week that has harassed the automobile manufacturers, reduced production, caused loss of time and money to workers and created new bitterness in the field of labor relationships.

Monday, May 17—Unauthorized and apparently without real reason, maintenance men in the Meldrum Avenue plant of the Briggs Mfg. Co. led off in the week of sporadic strikes when they pulled the fires in the factory and walked out, causing the laying off of 2000 men. The strikers asserted that the company had failed to pay them the same scale as similar employees of the Chrysler Corp., but when Emil Mazey, UAW organizer, and shop stewards met with the management, it was agreed that information was lacking on the Chrysler Corp. scale for similar work and that it would have to be obtained before negotiations got under way Tuesday. The strike, which lasted four hours, ended with a reprimand from Mazey, who said that the strike was called without consulting international officers of the UAW. Paint shop employees at the Gratiot Avenue plant of the Hudson Motor Car Co. also returned to work Tuesday after a walk-out that started at 12.30 p. m. Monday in protest over new wage rates.

Tuesday—Thirty striking employees of Thompson Products, Inc., manufacturer of automobile parts, were driven out by tear gas released by company police Tuesday night, a few hours after a sit-down had started because of a deadlock in negotiations on wages and vacations. The union has demanded vacations with pay after a year's service. The company says that it now grants vacations after five years' service. At the Kelsey-Hayes Wheel Co., a new union organization, the Federation of Architects, Engineers, Chemists and Technicians, engaged in a 30-min. sit-down in the laboratories and drafting rooms. The organization, an affiliate of the CIO, said that the management had refused demands of a bargaining committee.

Wednesday — The Champion Spark Plug Co. plant in Hamtramck had a sit-down when 600 of its 800 employees refused to work after negotiations were broken off on the subject of minimum wages and the proposed National Labor Relations Board election.

Thursday—Rivalry between the UAW and the Independent Chrysler Employees' Association kept the Plymouth Motor Corp. plant idle for 6 hr. Thursday. According to K. T. Keller, president of Chrysler, "the Plymouth plant was closed on account of a sit-down in two major departments, which we consider a violation of the agreement with the UAW. The difficulty arose on account of solicitation and coercion on company time and property." The company earlier had laid off six members of the ICEA, who were



caught passing out its cards. Motor assembly and main assembly lines shut down when the men returned to work after their disciplinary vacation. Also settled Thursday was a 3-hr. strike which affected 1500 workers at the United States Rubber Products, Inc. The strike started when members of the United Rubber Workers of America objected to working beside an employee they said was endeavoring to cause trouble between union and non-union men. At 10.30 o'clock at night the Ecorse plant of the Murray Corp. of America, manufacturing automobile frames for Ford, Dodge and Plymouth, was hit by a strike. Shop stewards argued with the shift superintendent over production speed-up and demanded that the management remove the superintendent. They also added demands for better ventilation and greater safety precautions. Terms of the settlement, reached at 5.30 o'clock the next morning, were not disclosed.

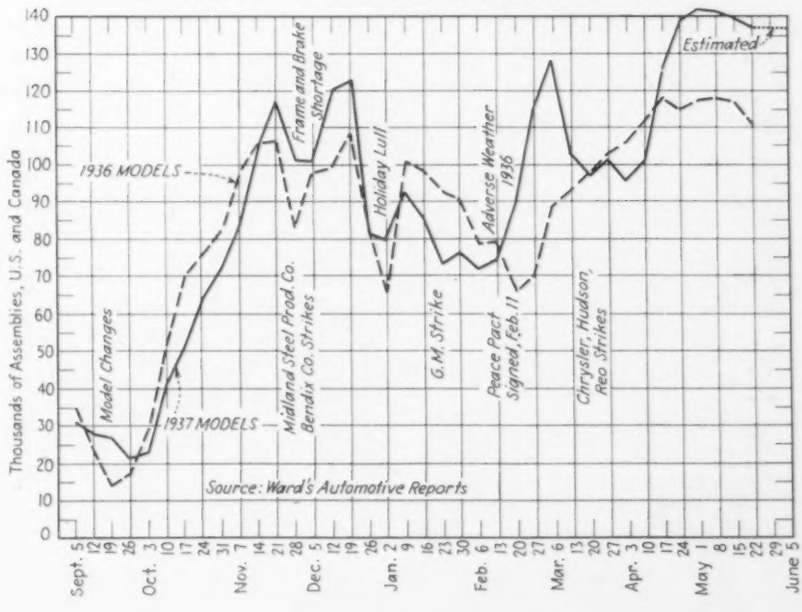
Friday — Saginaw settled one strike and two others were started while negotiations were still being carried on to settle the dispute which had caused the power strike affecting half a million people in the Saginaw valley. New strikes were at the Chevrolet parts manufacturing division, employing 1500 and the Wickes Boiler Co., employing 150. Settlement of a strike at the Lufkin Rule Co. put 900 men back to work, effective Monday. The two new strikes were walk-outs and were apparently the results of deadlocks in negotiations. Incidentally, the Chevrolet parts plant was moved to Saginaw from Toledo some time ago because of labor difficulties in that city.

Power Strike Called

The first of the week Michigan recalled with feeling Calvin Coolidge's words regarding the Boston police strike: "There is no right to strike against the public safety by anybody, anywhere, any time." When United Automobile Workers called a strike against the Consumers Power Co. and shut off power in three cities—Saginaw, Bay City and Flint—many vital services were crippled. Traffic lights, police signals and fire alarm systems were put out of use for half of Wednesday. Seventy-five thousand industrial employees were thrown out of work. Thirteen counties, 190 villages and cities felt the effects. Inability to locate Robert Travis, president of the Flint local of the UAW, for several hours was responsible in part for the delay in restoring power, after Wyndham Mortimer, UAW first vice-president, had acceded to Governor Frank Murphy's demand that the strike end.

Among the automobile plants affected directly were the Buick Motor Division and Chevrolet Motor Division and Fisher Body at

EFFECTS OF STRIKES AND WEATHER ON 1937 AND 1936 MODEL PRODUCTION



THE NEW TYPE "D" MULT-AU-MATIC

LOW COST PRODUCTION

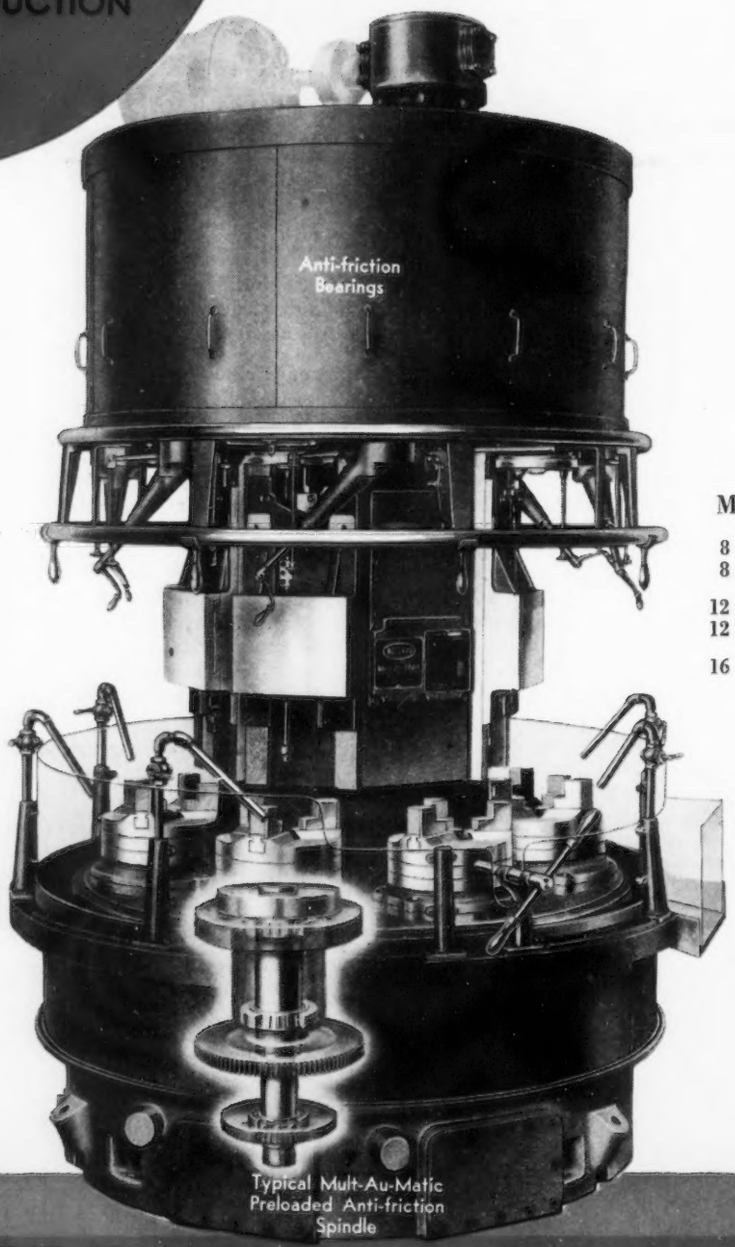
Anti-Friction bearings provide long maintained Accuracy and assure low maintenance costs.

Individual Independent feeds and speeds at each station permit proper settings for individual requirements of machining operations.

The Mult-Au-Matic Method provides a finished piece in the time of the longest operation, plus a few seconds for indexing.

If others can Profit by the use of Mult-Au-Matics, so can You. Ask for Bullard Estimates on your jobs.

- **FAST**
- **ACCURATE**
- **RIGID**
- **POWERFUL**
- **FLEXIBLE**
- **EFFICIENT**
- **DEPENDABLE**
- **PROFITABLE**



Typical Mult-Au-Matic Preloaded Anti-friction Spindle

Inbuilt Power Operated Chucking on order.

Independent and Variable Feeds and Speeds at each station.

Double Indexing, if required.

MACHINE SIZES

8 inch—6 Spindle
8 inch—8 Spindle

12 inch—6 Spindle
12 inch—8 Spindle

16 inch—8 Spindle

THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

Flint. Indirectly the results were felt in 11 Chevrolet assembly plants throughout the nation. So small is the bank of motor parts and assembled engines that the 11 Chevrolet assembly plants were forced to suspend operations the latter part of the week, to reopen Monday after supplies are again moved to them. The strike ended with a truce late Wednesday.

Governor Murphy took slaps at both participants. "I think the Consumers Power officials were negligent in allowing the situation to go to the length that it did. They agreed a week ago in my office to do certain things, which agreement hasn't been kept," he declared. And to the union and people at large Murphy said, "The State cannot and will not tolerate any more strikes of this kind." He claimed that the strike could not have occurred under the provisions of the labor relations law which he has asked. But at Lansing Thursday night the House of Representatives sidestepped a showdown vote on a resolution which would have urged the Governor to take over strike-bound utility plants. Some of the legislators, unwilling to be quoted, said that the resolution in reality would do nothing more than ask the Governor to exercise powers he already possesses.

Power Strike Unnecessary

Blame in this strike appears to fall equally, and both sides finally agreed with the Governor that the strike was unnecessary but there were abundant indications that internal union difficulties are largely responsible for the wild-cat strikes that have been prevalent in this Saginaw area. Travis, who has previously been embroiled in union politics, called the strike but was not present when the temporary settlement was reached. There was present, however, a former union organizer, Kempton Williams, once removed from the Saginaw area by the UAW, but reported to have the support of Saginaw union members. When the conferences began, only one Saginaw union man was admitted to the room. He was Thomas V. Gearhart, chairman of the local strike committee. Bay City representatives protested vigorously to Mortimer and threatened to quit the capital, where the parley was held, unless they were allowed to sit in. As a result, nine local delegates were invited.

With the Studebaker strike added in for good measure, thes trike activity cut approximately 3000 units from the automotive production volume for the week ended May 22. Production probably would have remained at the level of the last few weeks had it not been for the adverse conditions. Output of General Motors plants during the week dropped to 53,640 from 54,235 last week and Chrysler dropped to 28,675 from 29,975 last week, according to Ward's Automotive Reports. The Ford total was unchanged at 36,415 units. The week's total of 136,438 passenger cars and trucks in the United States and Canada compared with 139,507 in the preceding period and 110,845 in the corresponding week of last year.

Except for the unpredictable, there is every indication that production will continue at or slightly under 140,000 units per week during the weeks just ahead. Incidentally, Ward's tabulation of truck sales for the first quarter of this year, showing advances and declines by territorial divisions of the United States, is highly interesting. Sales of trucks are falling off in

(CONTINUED ON PAGE 86)

FORDISMS—

"A Monopoly of JOBS in this country is just as bad as a monopoly of BREAD!"

"Our men ought to consider whether it is necessary for them to PAY SOME OUTSIDER every month FOR THE PRIVILEGE OF WORKING at Ford's."

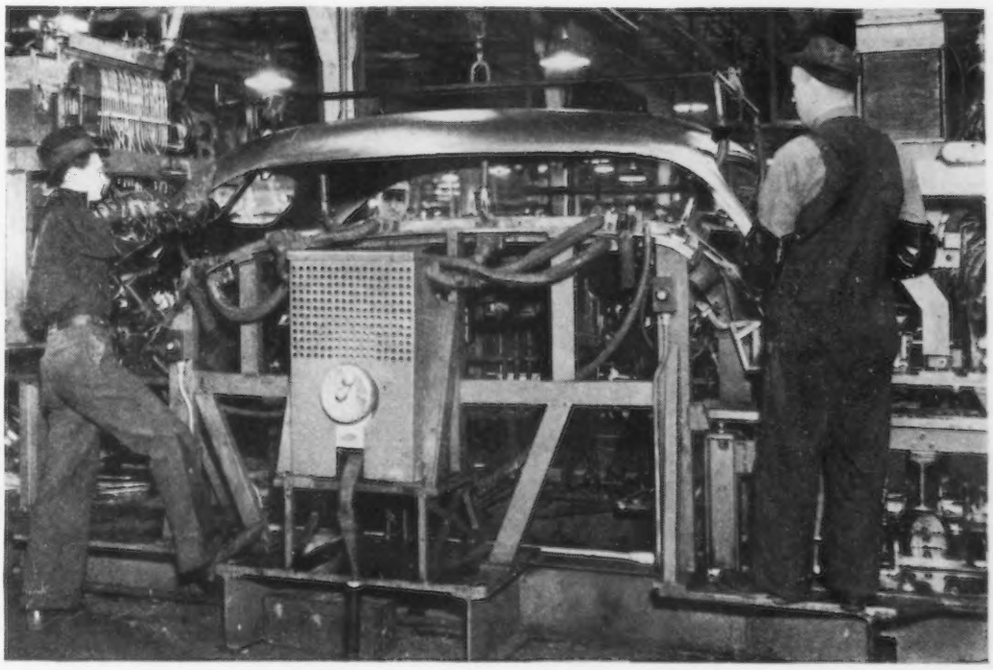
"What was the result of these strikes—merely that numbers of men put their neck into an IRON COLLAR. I'm only TRYING to SHOW WHO OWNS THE COLLAR."

"Figure it out for yourself. If you go into a union they have GOT YOU—but what have YOU got?"

"We have always made a better bargain for our men than an outsider COULD. We have never had to bargain against our men and we don't expect to begin now."

"There is no mystery about the connection between CORPORATION CONTROL and LABOR CONTROL. They are the TWO ENDS OF THE SAME ROPE. A little group of those who CONTROL BOTH CAPITAL AND LABOR will sit down in New York and settle PRICES, DIVIDENDS—AND WAGES."

EMPLOYEES of the Ford Motor Co. have been handed copies of these "Fordisms" in the Ford Company's fight against unionization by the CIO.



"STITCH welding" with hydromatic equipment attaches the drip molding to this Chrysler all-steel top, fusing the metal at 352 spots. The one-piece top is being placed in position here over the drip moldings which are on the track along which the weld is carried. Welds for this type of work are spaced a half inch apart, but quarter-inch spacing is common where greater stresses are borne.

WASHINGTON. . . . . .

. . . Price control in basic industries believed to be ultimate aim of administration in proposing wage and hour legislation.

o o o

. . . Roosevelt's bill probably will mean less self-control for industry than it had under the NRA.

o o o

. . . The turn that legislation will eventually take is still in doubt, but more regimentation for industry appears to be likely.

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By L. W. MOFFETT

Resident Washington Editor, The Iron Age

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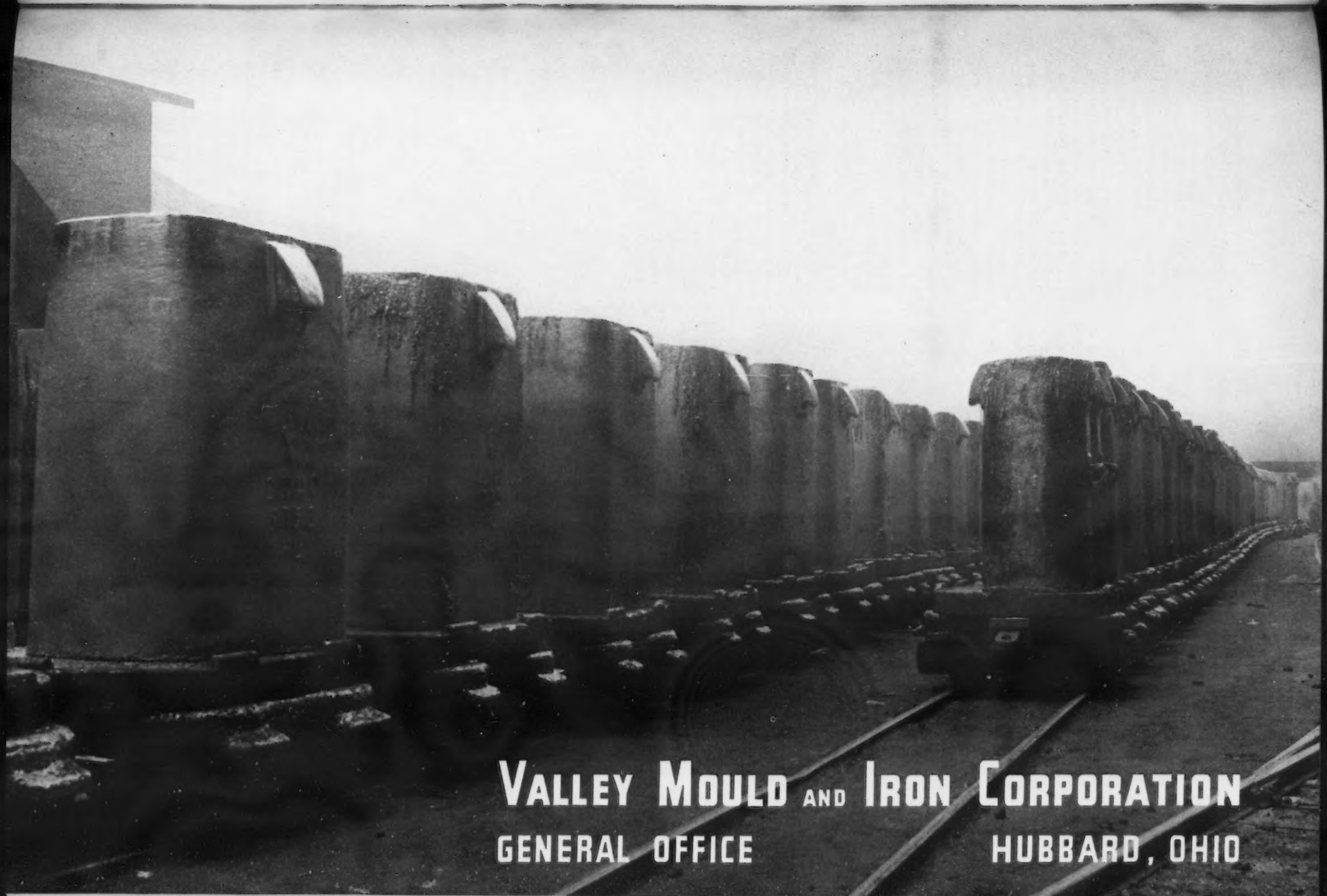
WASHINGTON, May 25.—Determination of the administration to push wage and hour legislation at the present session of Congress has aroused reports that the move is a forerunner of a renewed attempt to broaden industrial regimentation by the Federal Government. The view prevails widely that if the wage and hour control plan can be operated successfully by Washington it will be followed by separate legislation, perhaps at the next session of Congress, to control prices and output by governmental edict through a national commission.

Though such an attempt conceivably will be made at the present session, the belief is that this will not be done. Rather it is felt that the wage and hour control plan will be tried first as a test for projecting widespread governmental regimentation. The idea reported to be under consideration would be to give industry even less self-government than it was granted under the collapsed and invalidated NRA, with the Government itself having a completely dominating voice over fair trade practices provided they are fitted into the picture. The immediate objective is to omit them in wage and hour legislation, partially because wage and hour control in itself is held to be a strong governing force over trade practices. Additionally, it appears to be the view that specific provisions embracing trade practices should be approached gradually rather than to complicate wage and hour legislation.

Plans for far-reaching governmental control over industry definitely appear to be strangely conceived in view of the experience the New Deal had with the NRA. For it not only had pretty well crumbled into a failure during its operation but it was knocked out as unconstitutional by a unanimous decision of the Supreme Court. Answers are given to these points and the principal one is that new legislation will be so drawn as to avoid the weakness of NRA as set out by the Supreme Court. Another reply, whose adequacy is disputed is that the cumbersome and involved character of NRA, which forced it to bog down by its own weight, will not be repeated, but will be replaced with more simplified machinery, operated much more extensively by the Government and to a much less degree by industry. One of the Supreme Court's blasts at NRA was that Congress had delegated to the executive branch of the Government broad control over industry without stating more specifically just what its powers would be. The plan, it is said, is to provide the executive branch with a yardstick, indicating the extent and limitations of governmental control.

Administration Encouraged

It is obvious that the validation of the Wagner act has encouraged the administration in the belief that the Federal Government has widespread control over wages and hours, except in purely local business and industrial operations. Also on this subject it is likely additional assurance in this direction grows out of Supreme Court decisions such as that made in the New York minimum wage law and the Social Security Act. And even aside from the administration court packing plan, which definitely will not reach the dimensions originally proposed, the President is in a position to "liberalize" the Supreme Court as the result of the resignation of Mr. Justice Willis VanDevanter and the reported possibility of other resignations. But as to control over prices and production there is a serious


VALLEY MOULD AND IRON CORPORATION
GENERAL OFFICE
HUBBARD, OHIO

question that even a more "liberalized" court would validate legislation of this kind. Yet it could be attempted and put into effect before it had reached the court upon challenge of its constitutionality. Economically the plan has never succeeded and there are those who predict that, if undertaken, it will fail even before it could be taken to court, just as AAA control had flopped before AAA was knocked out by the Supreme Court. Just now such wide control is covered in the Guffey coal act but there are doubts that it will operate successfully.

The Ellenbogen bill to set up a little NRA for the textile industry provides not only wage and hour control but also production control. It is said to have been given administration approval, though it will be shelved, and replaced by general legislation covering wages and hours. Textile manufacturers objected to the bill because it singles out their industry and insist it should not be set apart from other industries. They contend that if such legislation is enacted it should be made general and include the textile along with other industries. There does not seem to be widespread objection to reasonable wage and hour legislation. The steel industry now has a 40-hr. week and of course pays twice the minimum of 40c. an hour in proposed legislation. There is a great deal of support from many industrialists for such legislation. The fear, however, is that the legislation will open the way for constantly increasing move for straitjacketing controlling industry, including effort to control production and prices. The prime movers for wage and hour legislation are organized labor leaders, who have been consulted by the President on the subject. Among the consultants are President William Green of the American Federation of Labor and John L. Lewis and Sidney Hillman of the Committee for Industrial Organization.

Price Control Favored

That ultimate price control is contemplated is based on expressions of the President himself, though he has not said it would be attempted through legislation. Nevertheless that such legislation is a definite prospect is indicated by expressions coming from such sources as Secretary of Agriculture Henry Wallace and other administration advisers, and President Green of the A. F. of L.

The Secretary of Agriculture has espoused the idea of industrial control in connection with his advocacy of the strange tie-up of labor and farm groups. Though historically far apart in their economic philosophies, the Secretary of Agriculture urges an affinity between labor and farm groups which "should not rest until they get bargaining power equivalent to that enjoyed by corporations." His new farm bill, providing for the "ever normal granary" inevitably means price and production control and he would apply price control to industry.

Mr. Wallace has proposed to the President that industrial control be undertaken along the lines he has suggested for agriculture. The Secretary of Agriculture has refused to comment on reports that he had submitted a definite program calling upon industrialists to discuss with the President theories Mr. Wallace advanced recently at Chapel Hill, N. C., "to restore stability of production, employment and prices." Whether correctly or not, the President is said to be favorable to the plan. In his Chapel Hill address, Mr. Wallace urged

that the establishment of industrial stability is essential to success of the proposed farm program. Comparing agricultural and industrial problems, he said that since "industry seems incapable of operating continuously under its own steam" the Government should "act as a stabilizer." He said that if labor, agriculture and business, left to themselves, are likely to produce another depression that the Government should "try to stop them from committing suicide." Technology and corporations, said Mr. Wallace, "in our modern economic society, make for increasing instability and ofttimes for waste of both human and material resources and even for bigger and deeper depressions."

Suggests Cooperatives as Means of Controlling Prices

President Green of the A. F. of L. has called on President Roosevelt to name a commission to study the problem of price control, with labor given a voice in the deliberations. Mr. Green affects particular concern over prices of steel and other basic commodities, which, he claims, have risen higher than wage increases. Mr. Green is toying with the idea of setting up cooperatives as a means of price control.

The President some time ago complained that prices of steel and other durable goods are too high, the upshot of which was the institution of studies now under way, which are said to look to price control.

One of the principal non-legislature suggestions made to bring down durable goods prices is to divert Federal expenditures from public works projects to consumer goods in greater quantities. This, despite the fact that in products such as steel, the importance of Government expenditures has been much overstated. Also the industry is engaged heavily on private work, so that withdrawal of Government expenditures probably would not occasion any effect on the operations of the industry at large. Despite the higher costs of raw materials, wage increases and shortened hours, it has reaffirmed second quarter prices for the third quarter and earnings, constantly threatened by labor trouble, are certainly only moderate, estimated at about 4½ per cent. In any event, whatever its importance, curtailing of Government expenditures on heavy projects would have no immediate effect inasmuch as present projects under way would be completed. Labor might well object to cutting down on such projects too, inasmuch as it benefits the most of any group from them.

The idea of giving the Federal Trade Commission or some other Government agency control over both prices and production is said to have been considered, but doubt prevails that this plan actually will be adopted. And less consideration likely is being given to the idea of reducing tariff duties as a means of bringing down prices. This sort of ballyhoo long has floated about—indeed is an underlying principle of low tariff and free trade advocates. Organized labor has been a consistent supporter of a protective tariff. It would undoubtedly raise an effective cry against a flood of cheaply produced imports of any kind that would injuriously affect American industry and employment. The reciprocal tariff bargaining power likewise would suffer if there should be a lowering of duties. Moreover, in such products as steel, for which there is a world hunger, it is doubtful if while this situation exists a reduction in duties would see much of a rise in imports. Nor is it

thought there will be any administration move for broad restriction of exports. This, too, would assuredly affect labor adversely, strike at the reciprocal tariff program, and affect taxes, which the Federal treasury needs so urgently.

Indeed, one means of avoiding inflation, which is a matter of administration concern, is the gathering of more revenue in order to balance the budget, which Governor Marriner Eccles of the Federal Reserve Board has argued is necessary if inflation is to be avoided. Governor Eccles is opposed to production control, which, with economists generally, he considers to be an inflationary factor.

The turn that legislation will take, therefore, is characteristically another matter of uncertainty, fitting to the confusion that continues to prevail in Washington. But more regimentation, even though its prospects of utter collapse are evident, is definitely in the mind of the administration as the White House has made known. The experience of NRA has meant nothing, nor has the sensible report on the NRA by the Committee on Industrial Analysis, despite the warm Presidential commendation of the report at the time it was submitted.

The Federal Trade Commission has extended the time for filing answers to its complaint against the Birmingham-plus basing point system from May 20 to June 9.

John L. Lewis Favors Shorter Work Week

WASHINGTON, May 25.—Discussing wage and hour legislation last Saturday with President Roosevelt, prior to introduction of the legislation in Congress, John L. Lewis approved the 40-hr. week, 40c. hr. minimum wage. In terms which appeared to be strikingly moderate for Mr. Lewis, aspiring to be labor boss of the steel industry, he told the press, upon concluding his conference with the President, that the Committee for Industrial Organization is for a reasonable approach to the question of wage and hour standards.

"There might be a board to consider each industry," said Mr. Lewis, perhaps giving a tip-off to further growth of the preponderantly over-grown Federal bureaucracy, "and the wage-hour standards need not be rigid."

Lewis said he told the President that work weeks must be shortened and that the CIO is "quite in support" of the administration's wage-hour legislation.

"We are definitely of the opinion," said Lewis, who was accompanied by Sidney Hillman, also prominent in CIO ranks, "that shortening of work weeks in this country is of vital necessity. We believe the prosperity that industry is enjoying now has the seed of accentuated unemployment through plant modernization and installation of labor saving devices."

Projecting further this theory of economic astigmatism, Lewis added:

"The mining industry, for instance, became more mechanized last year than ever before. It was the same with steel and every other major industry."

American Car & Foundry Co. is reopening its Madison, Ill., plant where it will fabricate 1000 freight cars for the Union Pacific. About 700 men will be reemployed.

Water Equipment Manufacturers Agree to Discontinue Price Fixing

WASHINGTON, May 25.—Alleging unfair methods of competition in violation of section 5 of the Federal Trade Commission Act, the commission last Wednesday entered an order against 33 companies and their officers to cease and desist from alleged combining and conspiring to fix and maintain uniform delivered prices in the interstate sale of water gate valves, hydrants, fittings and similar products used for water supply systems.

The commission charged that the practices complained of have a dangerous tendency to hinder and prevent price competition, have increased prices and have created in the affected members of the water works, valve and hydrant group a monopoly in the sale and resale of their products.

The order of the commission is considered to have marked another attempt to abolish uniform delivered prices, though its power to do so has been challenged. In its campaign, the commission has resorted to both the Federal Trade Commission Act and the Robinson-Patman Price Discrimination Act.

The order against the hydrant makers also is directed against the water works valve and hydrant group of the Valve and Fittings Institute, its governing committee and two officers of the institute, George V. Denny, president commissioner, and Sam G. Moyers, assistant secretary. The commission said that all but one of the respondent companies are members of the water works valve and hydrant group.

Selling their products principally to municipalities and to divisions and institutions of the Federal and State governments, the respondents, according to the Federal Trade Commission, dominate their industry in the United States.

The companies filed answers in which they consented, the Federal Trade Commission said, that all the material facts alleged in the commission's complaint against them "might be deemed to be admitted, but not within the intent and meaning of any law of the United States other than the Federal Trade Commission Act, such answers not constituting an admission of any conclusions of law and not constituting an admission of fact for any other purpose, nor to be used against them in any other proceeding, suit or action."

The order to cease and desist prohibits the respondents from engaging in the following practices in the furtherance of any price fixing combination:

Agreeing to fix and maintain uniform delivered prices for their products and to fix uniform discounts in the sale of such products to jobbers and distributers; agreeing to divide, and dividing the United States into zones in which they fix and maintain by agreement the uniform delivered prices to be paid by purchasers of their products; agreeing to fix uniform delivered prices at which jobbers and distributers should resell the respondent companies' products, and refusing by agreement among themselves to continue selling to jobbers and distributers who have not resold at the prices so fixed.

Member companies of the water

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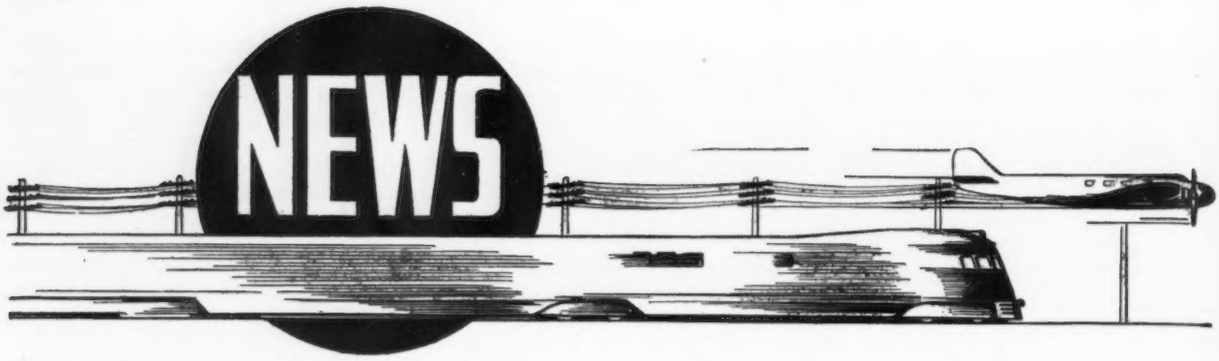


W. A. IRVIN

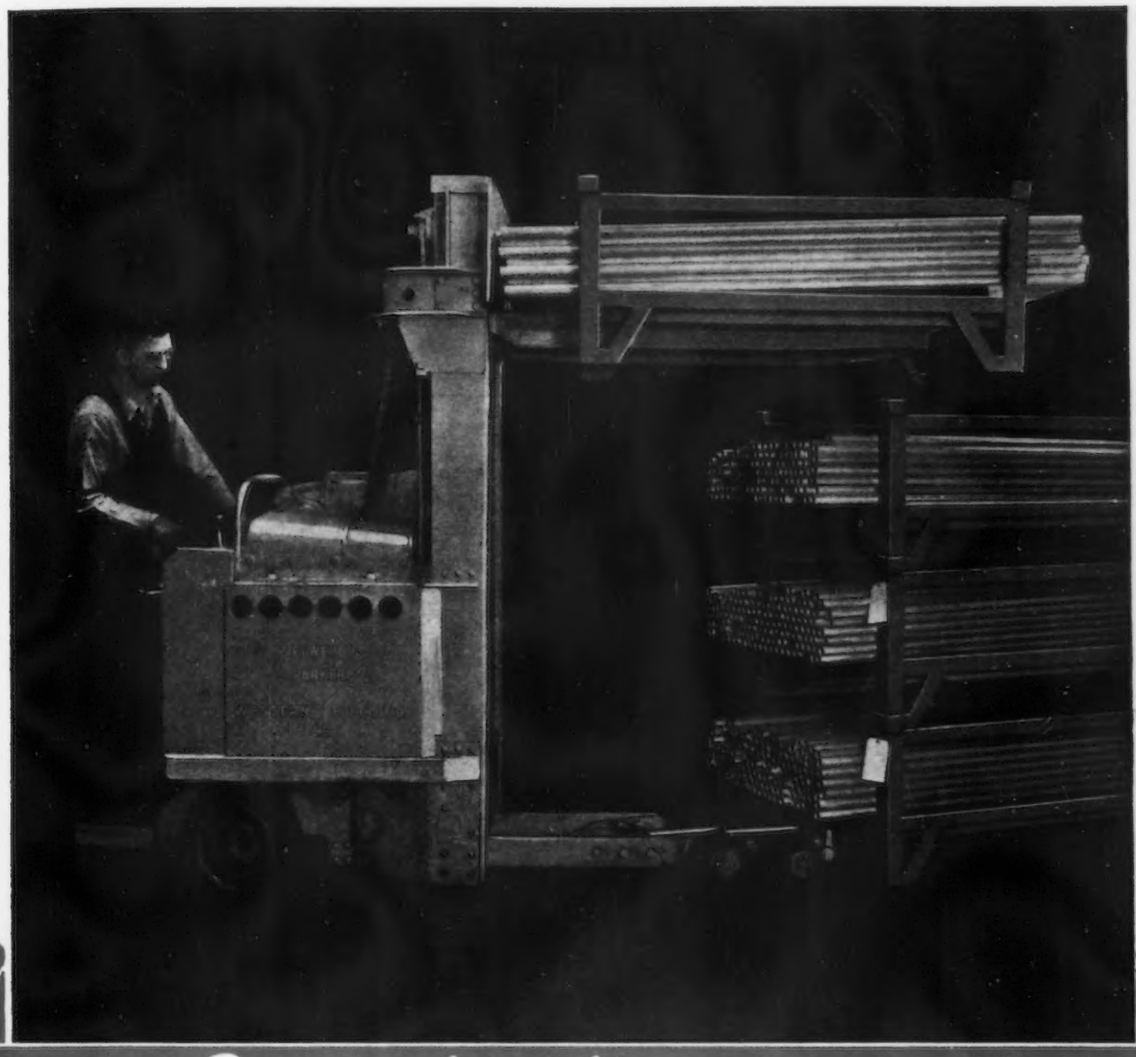
William A. Irvin Breaks Ground For New Mill That Bears His Name

TERMING the stainless steel spade held in his hand as "appropriate sybolism," William A. Irvin, president, U. S. Steel Corp., formally broke ground last Saturday, May 22, for Carnegie-Illinois Steel Corp.'s new $60,000,000 sheet, strip and tin plate mill which bears his name. The ground breaking ceremonies took place on the proposed site of the Irvin works and were attended by civic leaders, U. S. Steel Corp. and subsidiary officials, a large number of Carnegie-Illinois Steel Corp. personnel and many other guests as well as spectators from surrounding and nearby cities.

Benjamin F. Fairless, president, Carnegie-Illinois Steel Corp. lauded Mr. Irvin's record with U. S. Steel and also described briefly the outstanding features of the new mill. He pointed out that the new plant will be situated about 220 ft. above the level of the Monongahela River and is probably the first installation of a major plant on top of a hill. The construction work involves a complete change of the surrounding landscape as the plans require the moving of 3,500,000 cu. yd. of earth, and the construction of the foundations will involve the pouring 150,000 cu. yd. of concrete. In the construction of the buildings, which will cover an area of 52 acres, 27,000 tons of steel will be utilized. The group of buildings will be 4200 ft. long and 1250 ft. wide. An additional 100 acres are required for warehousing, shipping yards and other facilities.

Interesting to those in the Pittsburgh district was Mr. Fairless's statement that the tract of land of 600 acres affords sufficient space for the duplication of the plant as now proposed and it was the company's earnest hope that the day is not far distant when the entire tract

NEWS AND MARKET INDEX



THE *Greatest* ASSET IS AN ALERT, *Creative* MIND!

ADVERTISING on this page is continually showing the great economies made possible through the Elwell-Parker System of Materials Handling. Here is one fine example. This prominent company greatly reduced its costs in this department by handling skid racks and their loads *as a unit.* The racks themselves perform the same function as do skids or pallets used in the Elwell-Parker System for handling Boxes, Barrels, Bags or Bales. Racks are designed with special supports which permit tiering material to reasonable heights.

You know why tremendous reductions in materials-handling costs must be made in the near future. Why not call in an Elwell-Parker Engineer, with long training in Materials Handling, to discuss with one of your own men the newest methods of eliminating wasteful transportation practices? His successful experience elsewhere will surely help you. Send for him now. Elwell-Parker, 4225 St. Clair Avenue, Cleveland, Ohio.

New Type ELWELL·PARKER *Trucks*

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

will be used and occupied by additional mills.

The principal units of the new plant will be an 80-in. continuous hot strip mill; an 84-in. three stand tandem cold reducing sheet mill and a 42-in. five stand tandem cold reducing tin mill, and a 54-in. four high reversing type cold reduction mill. Also to be installed are three 84-in. four high temper pass mills, two for strip or sheets and one for sheets only, and three 84-in. two high temper pass mills, two for strip or sheet steel and one for sheets only. In addition to the wide temper pass mills, there will be a 42-in. four high temper pass mill for strip and two 42-in. four high two-stand tandem temper pass mills for strip.

Plans also call for the installation of 50 bell type annealing furnaces to take care of both sheet and tin plate products. An electric normalizing furnace will be installed as well as three continuous cleaning units for tin plate strip and one for sheets. A coil pickling unit which will accommodate coils of strip up to 38-in. in width has been provided for.

Mr. Fairless stated that the preparation of the site and the construction of the various units of the plant will provide employment for thousands of men and, when ready for operation, the services of 4000 regular employees will be required, of which 90 per cent will be skilled. Annual capacity of the mill will be 600,000 tons or more.

Pays Tribute to W. A. Irvin

Commenting on Mr. Irvin's career in the steel industry, Mr. Fairless said,

"And now it becomes my privilege to present a man who is well known to most of us and enjoys our respect and admiration. He attended Indiana State Normal School, but starting at an early age as a telegraph messenger, his rise in the business world has been sure and steady. Most of his business life was spent in Pittsburgh, where he made a host of friends and acquaintances. The fact that he has retained these friendships through the years speaks volumes for the character of the man.

"He has gone up the ladder of success, step by step, never wavering, never faltering, until in March, 1932, he was called to the position of president of the U. S. Steel Corp. His successful administration of the affairs of that great corporation has made him an outstanding figure in the business world, and it is peculiarly fitting and appropriate that this great plant should bear his illustrious name."

Mr. Irvin spoke his profound appreciation of the honor conferred upon him by the company in naming their new plant the Irvin Works. Referring to the years in which the huge earlier plants were constructed in the valley, he said that it would have taken a person of great vision to have pictured the tremendous advancement in its phase of steel making that is now embodied in the plans for Irvin Works. He paid tribute to the leaders who made possible a productive giant of Pittsburgh and its neighboring communities and likewise praised the skill and ingenuity of the engineers who designed the new plant.

After pointing out that Andrew Carnegie's initial investment in the tiny Kloman forge that was the nucleous of his great steel organization was less than $9,000, Mr.

Irvin said: "Within a short time you will see erected on these premises the latest version of a steel plant of its kind, multiplying Andrew Carnegie's original investment by 7000 times and incorporating improvements of which he never even dreamed."

Turning the first spadeful of earth, Mr. Irvin said: "Permit me to express in deep sincerity the hope that the happy relations among the men, the management, the customers and the public which have been ours for so many years in this valley may continue long into the future."

Steel & Wire Forms New Division

THE American Steel & Wire Co., Cleveland, has created a central metallurgical department designed to coordinate and assist the district metallurgical departments which are kept intact. The new department is headed by J. S. Richards, formerly director of manufacturing practices and is a division of the operating vice-president's office. Besides Mr. Richards, the personnel of the new division consists of C. W. Meyers, assistant manager, and the following division metallurgists: W. F. Conlin, in charge of steel standardization, practices and committee work; J. R. Thompson, in charge of low alloy and carbon practices; A. E. Hibschman, in charge of high carbon and special practices; C. A. Schacha, in charge of metal practices, and E. F. Oviatt, in charge of packaging, specifications and general standard practice activities.

Patterson Foundry To Double Capacity

PATTERSON FOUNDRY & MACHINE CO., East Liverpool, Ohio, manufacturer of crushing, grinding, mixing and processing equipment, announces that it will double its production facilities within the next two years. Additions to the machine and fabrication divisions have been made that have increased the capacity of these departments approximately 50 per cent while the construction of a new tunnel kiln at the Porox Division will greatly increase the capacity of that department in the production of lining blocks and grinding balls. The Patterson company has been in continuous operation for over 70 years.

A.S.M.E. Holds Semi-Annual Meeting in Detroit

HONORARY membership in the American Society of Mechanical Engineers was conferred Thursday, May 20, upon Dr. Alex Dow, past-president, for his technical achievements in the Detroit Edison Co., for the financial wisdom he has displayed and "his unusual sagacity in management." This presentation was made at the semi-annual meeting in Detroit May 17 to 21 and followed immediately Dr.

Dow's citation of Henry Ford and the presentation to Mr. Ford of the Holley medal for outstanding engineering achievements. James H. Herron, A.S.M.E. president, presided. Registered attendance was 911.

Col. Willard T. Chevalier, McGraw-Hill Publishing Co., who analyzed the relationship of mass production and higher living standards in the address which was featured at the final night session, said that there really are creative gamblers as well as purely acquisitive gamblers. The creative people, he said, have set up American business enterprise as a clearing house of services—those of employers and customers. The employer provides the place and the means of doing a business in services. His reward is profit which he reaps only so long as he provides an efficient exchange.

Colonel Chevalier, past-president of the American Society of Civil Engineers, attacked the theory of distribution as the bottleneck in our economic system. We are still existing under an economy of "production and exchange" with money a laundry check and production merely the shirts on the shelves. We have not yet devised a system of tokens and checks to give an equitable exchange of produce without the danger that someone will accumulate too many laundry checks without having anything on the shelves to back them up. We should not be staggered by approaching the job of finding a remedy for the depressions which have beset us, he said.

Kettering on Research

On Tuesday night Charles F. Kettering, vice-president of General Motors in charge of research, substituted for William S. Knudsen, the corporation president, who was unable to be present. Industry, Mr. Kettering said, must set up its research appropriations on an actuarial accounting basis. Detail accounting is unsatisfactory because research represents the one item of business which cannot forecast its costs, tell what it will do in advance, or estimate the value of what it does. The actuarial basis is necessary because research, like an insurance company, cannot be interested only in specific cases but must be satisfied with looking down the road and discovering tendencies. Eliminating faults from designs, he said, is not a good research problem; but carrying a new product through the zone between its theoretical design and the stage where it is economic and can obtain public acceptance is, Mr. Kettering declared, a real problem for research because American industry now expects an industrial "child" or product to be earning its living before it is a year old.

He criticized the tendency always to want new things to look like old and said that the first automobiles not only had whip sockets and line guards to make them look like carriages, but even had false heads of horses in front. Research must concern itself with public acceptance of new things and can learn a lot from the customer, but should be careful

OTTO FRANKE (left), master mechanic of Plymouth Motor division of Chrysler Corp., shows visiting members of the A.S.M.E. semi-annual meeting how a photo-electric cell stops materials coming up to the assembly line until the proper part has been taken off to go on the chassis. This was one of the many plant visits made.

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SPEED, precision, flexibility and smooth action are combined in the modern Centerless Grinder. With Sunoco you can utilize all these advantages and thereby obtain maximum production at lowest cost because it offers these six invaluable aids for improving grinding operations.

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4—Smoother surfaces—brighter finishes

5—Prevents gumming of the abrasive wheel

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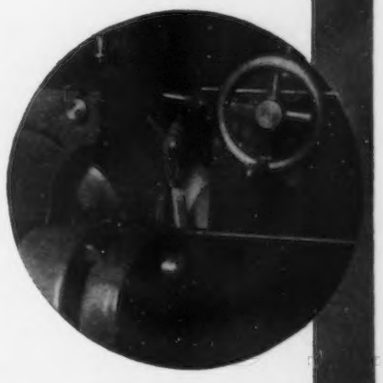
Year after year, in many plants under a variety of operating conditions, Sunoco has increased the productivity of machines and improved the quality of the output. It will, therefore, pay you to get the facts on Sunoco and test it in your plant under your own operating conditions. To assist you in making such tests the services of our experienced cutting oil engineers are at your disposal without obligation.



Operation: Finished Grind Large Diameters
Machine: No. 2 Cincinnati Centerless Grinder
Material: Cold Rolled Steel
Spindle Speed: 1150 R.P.M.
Coalant: 1 part Sunoco to 40 parts Water

Operation: Grinding Piston Pins
Machine: No. 2 Cincinnati Centerless Grinder
Material: Hardened Steel
Production: 28 per minute
Coalant: 1 part Sunoco—40 parts Water

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in its survey methods because the public always wants what it has heard is new. The right kind of investigation in these really important problems, Mr. Kettering said, is to offer a choice between two things already available in order to find the trend of public choice.

Reasserting that many discoveries were accidental, Mr. Kettering suggested that a proper research program would place the best available engineer on the logical route to solving a problem and the two next best engineers on the opposite route, with the chances in favor of their discovering the right answer. As for technological unemployment, he denied that engineering was ahead of society and that it had created machines to put men out of jobs. Instead, he said, science still has much to do. It really lags behind society's ability to make use of the machines and science has not yet created enough new jobs to offset the effects of standardization and mechanization that have eliminated some jobs.

Ford's Policy Explained

Interesting aspects of Ford's decentralization program were presented on Wednesday night by William J. Cameron, Ford Motor Co.'s radio commentator. He explained the apparent conflict or dual program of decentralization and concentration that is going on at Ford's at the present time. "This is not a meaningless shifting around such as the carrying of coal from one place to another and back," he said. "The programs are complementary and compensatory." He added that when part of the huge Rouge plant was severed and made a village industry a few miles away it was "not repairing a serious error in judgment; it is a logical development of industrial experience. The thing decentralized is never the same thing as that which was centralized. It is what we have learned in mass production that makes decentralization possible."

To make clear his distinction, Mr. Cameron offered the definition of decentralization as "taking away *parts* to operate separately. This presupposes centralization but can be applied only to parts that are susceptible to decentralization." It must not be confused with regional centralization or the opening of branch plants, he said.

What factories have done for adventurous segments of the population, he said, is to attract them from the farms and even from the hills. There had been a process of "educating hillbillies" so that when these individuals leave industry to return to their homes, they take back new social values, more knowledge and a sense of initiative. Such emigration from industrial centers exists to a surprising degree, he declared.

Historically, the Ford village industry program had its inception in the conversion of a Rouge River grist mill for manufacturing purposes in 1918. On the Rouge there now are eight Ford village industries, employing from 15 to 400 in each plant. Of the 25 established plants, four, he said, are too large to be classed as village industries, nine are still in the process of development and one of the smaller plants manufacturing tail lamps and switches employs only 94, all of them women. The total number employed in the village industries is 4000.

Auto Prices Not "Administered"

On the program with Mr. Cameron was John W. Scoville, statistician for the Chrysler Corp., who spoke on "Methods of Control in the Automobile Industry," presenting an array of charts and interesting figures on virtually every phase of the automobile industry. He opposed the theory advanced by outsiders that automotive prices are "administered prices and noncompetitive" and declared false the charge that the automobile industry sets prices to maximize profits. He showed that retail prices of automobiles followed approximately the curve of retail prices of other items, such as food, falling during

the depression to about 65 per cent of the 1929 level.

He showed that the average production per employee-year had not changed much since the earlier days of the industry and that today, as 10 or 12 years ago, the average is 10 cars per employee-year despite the fact that the hours of employment are decreased, the offset, of course, being attributable to increased efficiency. Seasonal unemployment, he said, has been exaggerated. It existed during the depression when executives were unable to anticipate how much worse conditions would get and so were unable to schedule production over long periods. On automobile financing, he showed that as car sales rose in the summer months, the percentage of financed sales compared to cash sales increased and that winter figures indicated more cash sales and increased value of cars for trade-in purposes. Abstracts of several of the technical papers of interest to readers of IRON AGE will appear in ensuing issues.

Gray Iron Founders To Meet June 11-12

THE annual meeting of the Gray Iron Founders' Society, Inc., will be held June 11 and 12, at Hotel Cleveland, Cleveland.

Nominees for directors of the Gray Iron Founders' Society for 1937-'38 are: A. A. Campbell, Drake Engine Co., Grand Haven, Mich.; C. R. Culling, Garondelet Foundry Co., St. Louis; G. J. Golden, Golden's Foundry & Machine Co., Columbus, Ga.; E. C. Graham, Acme Foundry & Machine Co., Blackwell, Okla.; W. J. Grede, Liberty Foundry Co., Wauwatosa, Wis.; F. R. Hoadley, Atwood Machine Co., Stonington, Conn.; R. E. Kucher, Olympic Foundry Co., Seattle; H. R. Lafferty, Red Jacket Mfg. Co., Davenport, Iowa; W. P. Laytham, W. P. Laytham & Sons Co., Paterson, N. J.; C. B. Magrath, North Western Foundry Co., Chicago; S. C. Mefford, Auburn Foundry Inc., Auburn, Ind.; R. D. Phelps, Francis & Nygren Foundry Co., Chicago; J. H. Pohlman, Pohlman Foundry Co., Inc., Buffalo; P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, Ohio; W. L. Seelbach, Forest City Foundries Co., Cleveland; G. W. Shomo, Confer, Smith & Company, Hamburg, Pa., and R. S. Wheeler, Framingham Foundries, Inc., Framingham, Mass.

Use of Standard Motors Advocated At G-E Machine Tool Speed Show

USE of standard rather than special motors was urged by several speakers at the Machine Tool Speed Show held by the General Electric Co., at Worcester, Mass May 17, and notably by A. C. Danekind in an outstanding address on "Requirements of Electric Equipment for High Production Machine Tool Performance." Mr. Danekind is chairman of the factory equipment and practice committee of the General Electric Co., which, with more than 25,000 machine tools in operation in its various plants, is one of the country's largest users of such equipment. The following quotations from his address also emphasize the advantages of close cooperation between machine tool designers and electrical application engineers.

THERE is no questioning the fact that much progress has been made by the machine-tool industry, for users are showing a rapidly accelerated desire to purchase equipment which will reduce

both set-up time and the degree of skill necessary to operate the machine.

I note with considerable concern, however, the ever-increasing number of special motors which are appearing in recent machine designs. While it is a fact that the use of these motors is confined, for the most part, to fractional sizes which are used for auxiliary purposes, there are any number of glaring examples where a motor conforming to N.E.M.A. standards might have been applied if proper thought had been given the subject by the designer and the electrical application engineer when the machine was in the layout stage. Mechanical rather than electrical limitations in standard motors is apparently a designer's justification for selecting special motors for meeting specific requirements or conditions. All too often, however, cooperation with a capable electrical application engineer, when the machine was being laid out on paper for the first time, might well have overcome the necessity of resorting to the use of highly special electric equipment.

N.E.M.A. standards were established at the request of the National Machine Tool Builders' Association . . . and users of machine tools have every reason to prefer equipment operated by standard electric motors, and machine-tool designers have every reason to adhere to established standards insofar as possible.

Adequate Interlocking Required

Centralized control and motor-driven auxiliaries require adequate interlocking. I believe it advisable for a machine-tool designer to assume that if the control is arranged so that it can possibly cause a breakdown through mishandling of the controlling mechanism, it will probably be done and done shortly after the machine has been put in operation. This is the period when the machine will be under the closest observation by management and is, therefore, the time when the machine-tool designer's efforts are being appraised. It is unquestionably the job of the electrical application engineer to work in close cooperation with the machine designer in order that possibilities of breakdowns due to electrical limitations can be detected and eliminated. The cost of a few extra interlocking circuits is good insurance if they will definitely accomplish this result.

The primary objective of a machine-tool designer is to provide

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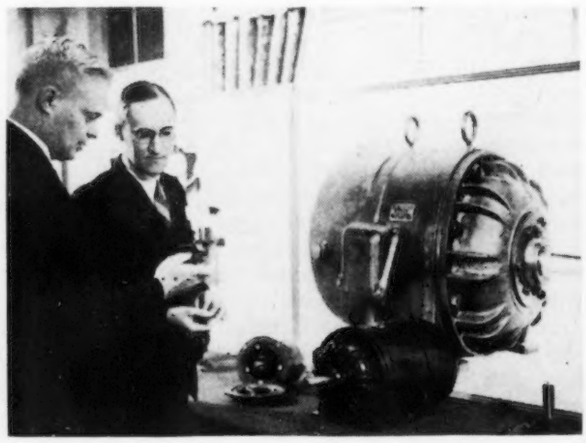

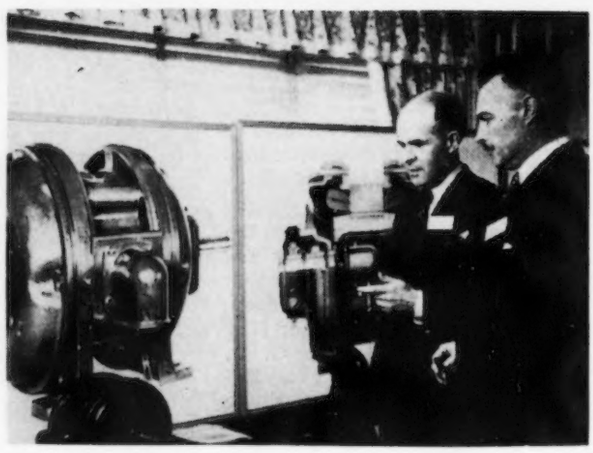

INSPECTING electrical equipment displays at the G-E Machine Tool Speed Show, held May 17 at Worcester, Mass., as reported in THE IRON AGE of May 20. Above are shown H. L. Blood, Heald Machine Co., Worcester, and W. R. King, G-E industrial department, and below are Henry K. Spencer, Blanchard Machine Co., Cambridge, Mass., and Norman D. MacLeod, Abrasive Machine Tool Co., East Providence, R. I. More than 125 representatives of Eastern machine tool companies attended this initial traveling presentation of latest electric equipment for machine tool application. Cincinnati was visited on May 24, and Rockford, Ill., will be visited May 28.

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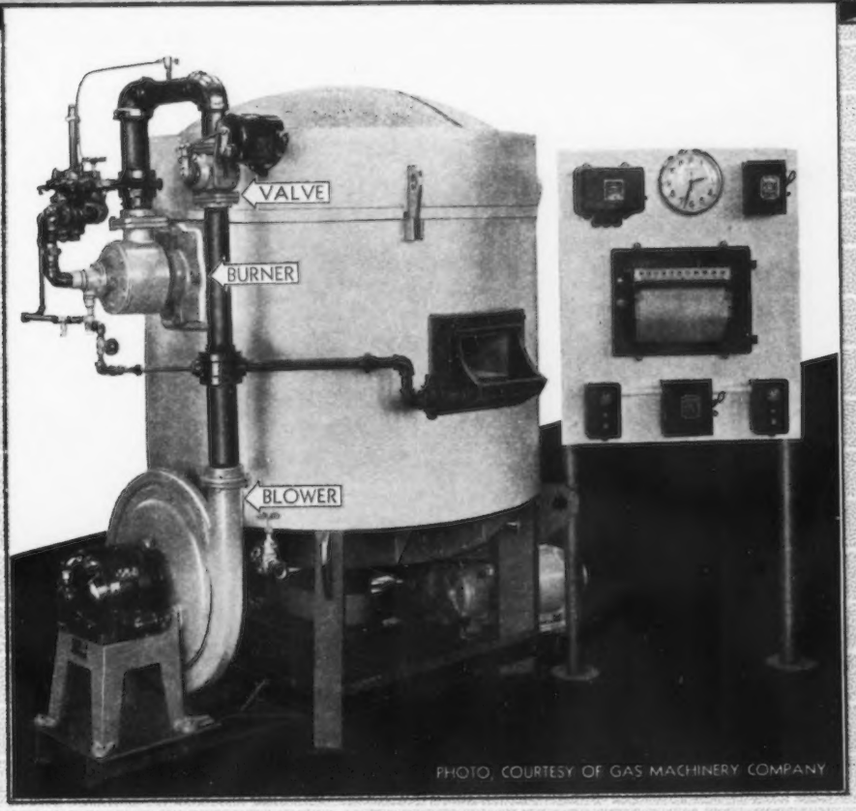
THIS IS ONE OF A SERIES



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equipment which offers increased output capacity, ease of operation, simplicity of construction, and low-cost maintenance. The use of electric rather than mechanical contrivances for driving and controlling a machine is definitely a more satisfactory means to that end. Electric equipment has grown to a point where it represents a very substantial portion of the total cost of a machine, and present-day mechanical design problems require particularly judicious application of electric motors, controls, and accessories.

Cooperation Between Designer and Electrical Application Engineer

Conditions under which machine tools are operated are usually severe. In view of these conditions—all of which are outside the control of a designer of machinery—it seems quite obvious that the success of any electrically operated machine depends in large measure on the fullest cooperation between the machine designer and the electrical application engineer while the design is in the lay-out stage. Unless this is done, operating limitations may well develop to place the machine-tool builders' reputation in a particularly vulnerable position.

Machine tools are nothing but contrivances by which energy may be either transferred or transformed. In themselves, they are just combinations of mechanisms; hence in use, and from an operating viewpoint, they are exposed to all the wiles of human attention. A machine-tool designer must expect his product to be subjected to severe operating conditions. He must go to extreme detail in giving consideration to every mechanical, hydraulic, or pneumatic principle at his command in an effort to obtain the ultimate in his machine. An electrical application engineer, by the same token, has a very definite obligation in properly applying electric motors, controls, and accessories to the designer's mechanism. Only by full and wholehearted cooperation between the two can machine tools be produced which will meet completely management's present-day conception of what constitutes adequately efficient equipment.

March Scrap Exports to Japan 220,452 Tons

FIGURES compiled by the Bureau of Foreign and Domestic Commerce, Washington, show that Japan took 220,452 tons of the 355,979 tons of iron and steel scrap exported from this country in March. Italy came next with 44,924 tons and the United Kingdom was third with 35,107 tons. Other countries that took smaller quantities of American scrap were Germany, Belgium, the Netherlands, Poland, Sweden, Mexico, Canada, China and French Indo-China. The total value of March exports of iron and steel scrap was $6,369,106.

Japan was also the largest customer for American pig iron, having taken shipments of 10,005 tons, which is only a small part of the shipments that will go to Japan in the next several months, Japan's purchases of pig iron in the United States within the past several months having totaled 350,000 tons. Total exports of pig iron in March were 14,435 tons of a value of $323,882. Next to Japan, the principal importers were Germany, which took 2000 tons, and Sweden, with 1357 tons.

...OBITUARY...

CHARLES E. HEATH, vice-president and general manager, Fate-Root-Heath Co., Plymouth, Ohio, manufacturer of industrial locomotives, died May 12, after a three months' illness, aged 65 years. A son, Earl W. Heath, is sales manager of the company.

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SAMUEL BARNETT, prominent in the Cleveland scrap iron industry for more than 20 years, and vice-president and general manager of M. Cohen & Sons, scrap dealer, Cleveland, since its organization in 1917, died May 12, aged 53 years. He was also a director of the Peerless Steel Products Co., Detroit.

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MERTON COVEY ROBBINS, chairman of the Robbins Publishing Co., New York, died of a heart ailment at the Columbia-Presbyterian Medical Center in New York on May 20, aged 62 years. After his graduation from the University of Vermont in 1898 with a degree in civil engineering, he served for a time as western representative of *Engineering News*. By 1910 he was general manager of THE IRON AGE, a position from which he retired in 1918 to start in the publishing business for himself. Mr. Robbins was active in publishers' associations, having been one of the founders of the Audit Bureau of Circulations, president of the New York Business Publishers Association in 1915 and president of the Associated Business Papers, Inc., in 1920.

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GEORGE A. RHOADS, senior partner and member of J. E. Rhoads & Sons, Philadelphia, since 1888, died on May 8.

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SAMUEL E. FRAZEE, vice-president of the Ewald Iron Co., Louisville, Ky., died at his home in that city on May 17. He was a native of Indianapolis and moved to Louisville in 1912.

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FRANK M. SPITZ, who was one of the founders of the Brown Fence & Wire Co., Cleveland, 35 years ago and president of that company since 1928, died May 16, aged 55 years.

JAMES WHITBY, for 34 years senior partner of George Warren Co., chairman of the London Iron and Steel Exchange, chairman of the metal trade section of the London Chamber of Commerce, former London agent for John Summers & Sons, Ltd., and former London manager of the Oriental Steel Co., Ltd., died in London on May 14, aged 70 years.

. . PERSONALS . .

C. M. YOUNG, who has been identified with the L. A. Young Spring & Wire Corp., Detroit, for many years, has been elected president of the company, succeeding his uncle, L. A. YOUNG, who has become chairman of the board. The new president, who is only 30 years old, entered the employ of the company at an early age in the operating department and later joined the sales, executive and administrative staff.

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JULIUS P. HEIL has been elected president of the Jambor Tool & Stamping Co., Milwaukee, manufacturer of automobile replacement parts and specialties, to fill the vacancy caused by the resignation of FRANK M. SMITH. He also is president and treasurer of the Heil Co., Milwaukee, manufacturing motor truck bodies, hydraulic hoists, tanks, oil burners, and other metal products.

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C. C. JORDAN has been appointed assistant manager of the steam turbine division, Allis-Chalmers Mfg. Co., Milwaukee. He began his association with the company by way of its graduate student course and after a number of years in field service work and sales estimating was appointed a sales engineer in 1927.

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CHARLES S. WHITNEY, consulting engineer, Milwaukee, has been notified that he has been awarded the Fuertes gold medal by Cornell University for his research in the design of reinforced concrete structures, which should result in more economical buildings and bridges. He is best known as a bridge designer.

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RICHARD T. ERBAN, consulting engineer, New York, has been awarded an Edward Longstreth medal by the Franklin Institute, Philadelphia, "in consideration of the invention and development of the Transitorq, a practical and useful variable speed transmission unit." HERBERT L. WHITTEMORE, chief, engineering mechanics section, National Bureau of Standards, Washington, has also been awarded a Longstreth medal "in consideration of his part in the invention and development of the proving ring for the direct checking of calibrations of testing machines."

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FRANCIS HODGKINSON, until recently consulting engineer for the Westinghouse Electric & Mfg. Co., has been appointed honorary professor of mechanical engineering at Columbia University.

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DR. EARL G. STURDEVANT, who has been identified with United States Rubber Products, Inc., New York, has been appointed consulting engineer of the company's electrical wire and cable department.

E. D. LE MAY, whose appointment as director of public relations of the Tennessee Coal, Iron & Railroad Co., a newly created department of the company, was announced in these columns on April 22.

J. P. BOORE, for several years vice-president of Summerill Tubing Co., and for 20 years prior to that associated with the Pittsburgh Steel Co. in various capacities in the production and sales departments, has been made assistant general sales manager of the Babcock & Wilcox Tube Co., Beaver Falls, Pa.

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CHARLES D. BRENNER, who has been identified with the Maydwell & Hartzell, Inc., San Francisco, since 1930, has been assigned to the southern California territory in charge of steel product lines including those of Russell, Burdsall & Ward Bolt & Nut Co. and Positive Lock Washer Co.

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CARL E. SPROUT has been appointed an associate of B. W. SAYER, district manager of the Portland, Ore., office of the Foxboro Co. Mr. Sprout has been

Cleveland Tramrail Materials Handling Equipment

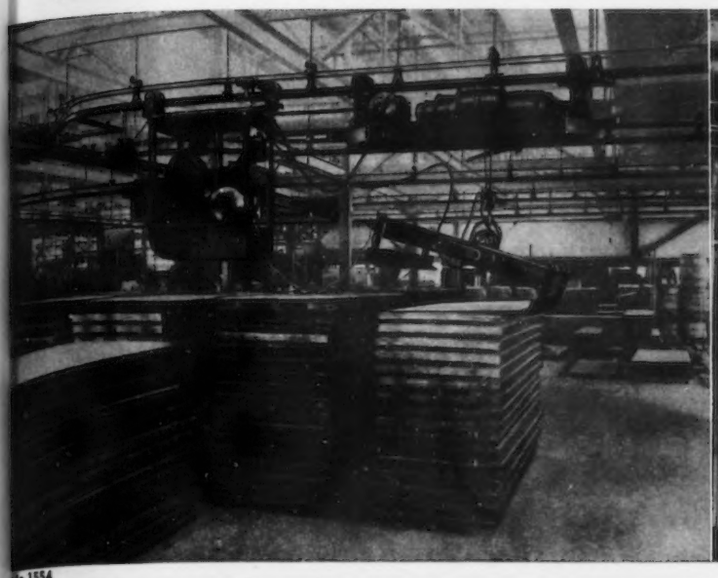

Photo 1554

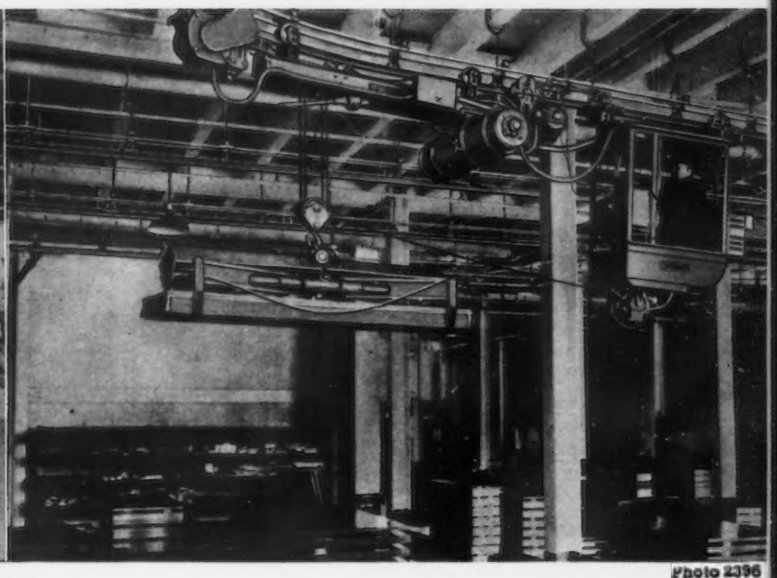

Photo 2396

Cleveland Tramrail

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● The ability of Cleveland Tramrail engineers to design equipment and to plan or lay out a materials handling system, that will safely and successfully handle the intended loads and become part of the production process, is well illustrated in these installations of Motor operated carrier, hoist and grab; all operations of which are controlled from the cab.

Photo 1554 shows what is possible to accomplish by a little practice —this operator can pick up one sheet or full capacity loads —no floor man needed.

Cleveland All Welded Cranes For Every Industry

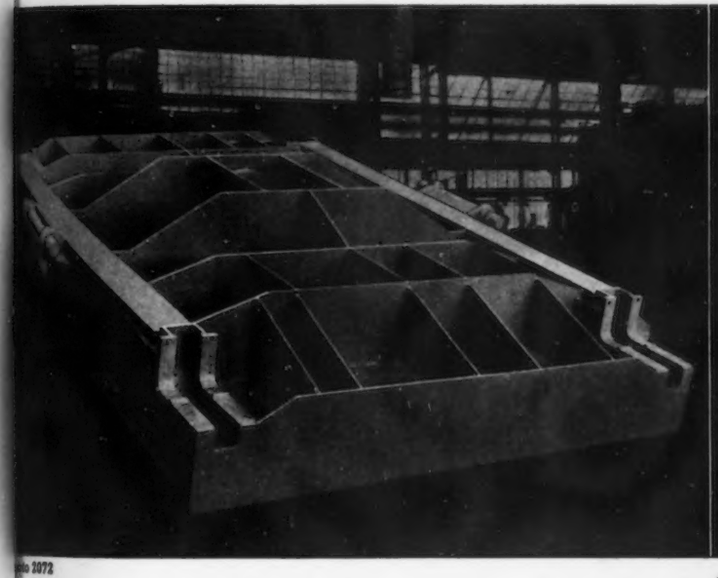

Photo 2072

Photo 2071

eveland Trolley Frames

ll Welded — One piece of "worked" steel. Every pound olled steel so placed as to be most effective. No excess ght—but greater strength, rigidity and reliability.

Cleveland Cranes

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The Cleveland Crane & Engineering Co.

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Wickliffe Ohio

identified with the San Francisco office of the company.

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R. L. LEVENTRY, whose appointment as district manager of Youngstown operations for the Republic Steel Corp was announced in these columns May 6, has been associated with the company for the past 19 years. Prior to that he attended Cornell University and worked at a great variety of mill jobs with the Cambria Steel Co. (now Bethlehem Steel Co.), where he was assistant superintendent of open hearths in 1917 and 1918. He became identified with Republic as superintendent of open hearths at Youngstown in 1918 and was also placed in charge of the mills three months later. In 1927 Mr. Leventry was named assistant district manager and continued in that capacity until 1935, when he became general superintendent.

FRANK E. FLYNN, who has been named district manager of Warren-Niles operations for Republic, spent 15 years with Superior Steel Co., at Carnegie, Pa., and was boss roller there when he left to join the old Phillips Sheet & Tin Co. as boss roller for all strip operations. In 1928 he joined the Trumbull Steel Co. as assistant vice-president in charge of operations, and he had been assistant district manager of Republic Steel at Warren from the formation of Republic to October, 1935, when he was named general superintendent.

B. W. NORTON, who has been associated with the Republic Steel Corp. and its predecessors in the coke plant and blast furnaces since 1925, has been named assistant district manager for the Youngstown district. He has been superintendent of blast furnaces and coke plant since 1933. He was graduated from Penn State College as a metallurgical engineer in 1925.

F. C. Farrell, who has been identified with the iron and steel industry since 1903 and has had a wide range of experience in steel making operations throughout the Youngstown-Warren sector, has been appointed assistant district manager of the Warren-Niles district.

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W. H. PAPE, who joined the Crane Co., Chicago, in 1927, as special representative in New York and later in the Boston territory, has been made manager of the valve and fitting department of the company. The former industrial sales and engineering sales departments have been consolidated into a new section, the engineering sales section of the valve and fitting department, with E. BURKE as manager of this section. G. F. WRIGHT has been made assistant manager in charge of estimating and other activities dealing with fabricated pipe and allied products, and W. F. LAHL, assistant manager, supervising the industrial zone men in the field. J. H. BARKER is manager of the sales quotation section of the valve and fitting department.

R. L. LEVENTRY

F. E. FLYNN

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ROBERT C. WEBSTER was given a dinner by his business associates and friends in the Cincinnati Club last Thursday night to mark his retirement from the managership

B. W. NORTON

F. C. FARRELL

of the Cincinnati office of the Crucible Steel Co. of America. He has been associated with this company for 33 years. He started with the company in Chicago and for 30 years has been stationed at Cincinnati. Mr. Webster will be succeeded in the local managership of the company by H. E. FRIEDLEIN, who has been associated with him here for over 25 years.

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JOSEPH J. SWEENEY, formerly connected in a sales capacity with Botfield Refractories Co., has taken over the Eastern territory as sales representative for the Thermal Products Corp., Pittsburgh. He will be located at 737 South Frazier Street, Philadelphia.

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HAROLD C. HATCH has been named sales engineer of the Mead-Morrison division of Gar Wood Industries, Inc., Detroit. Mr. Hatch has been with the company for the past three years in the capacity of assistant engineer of the Mead-Morrison division, which manufactures a line of winches, cranes and pole derricks.

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MARTIN RIEGER, JR., has recently joined the New York office of the Foxboro Co., Foxboro, Mass., as a specialist in the pyrometer division of that company. Mr. Rieger is an electrical instrument engineer formerly connected with the Weston Electrical Instrument Corp.

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WILLIAM BARNES, formerly assistant master mechanic of the Chrysler Corp., Jefferson Avenue plant, Detroit, has joined the Welker Machinery Co., Detroit, as sales engineer.

Gary, Ind., Employment Highest in History

GARY, Ind., industrial plants are employing more men and women than at any other time in the history of that city.

The payrolls now include 33,150 persons, 6289 more than were at work in 1929, while personnel is up about 2500 from a year ago. Of those at work, 91 per cent, or 30,200, are employed in subsidiary plants of the United States Steel Corp. The three Carnegie-Illinois plants—Gary works, and sheet and tin mills—account for 28,400 employees, although at one time this year these mills employed 28,600 persons, 200 more than at present.

Industrial heads state that the primary reason for the increase in employment is changed operating methods, entailing multiple handling of products, to meet more exacting customers' requirements and specifications.

Holiday Will Delay June 3 Issue

OWING to the holiday on Monday, May 31, our printing plant will be closed, and for this reason the June 3 issue of THE IRON AGE will be published and mailed one day later than usual.

This Week on the Assembly Line

(CONTINUED FROM PAGE 63)

virtually the entire section of the United States from the Rocky Mountains to the Mississippi River, from Canada to Mexico. "This is the area beset by dust storms and other agricultural troubles of various sorts," Ward says. However, the outlook for the summer and fall is reported exceptionally hopeful in this area and commercial car sales along the Atlantic seaboard are increasing. Other gratifying reports continue to come in on used car sales, with the supply on hand being whittled little by little, as in the case of Buick, which now reveals that used car stocks in its dealers' hands represent 27.1 days' supply based on current turnover.

Olds' Automatic Transmission

Incidentally, while there has been no word from Buick about the new automatic transmission which it is manufacturing, Oldsmobile has just made public announcement of its use of the transmission, to be offered as optional equipment immediately on 1937 Oldsmobile eights. This transmission, as previously revealed in this column, was nearly ready for release last fall, but minor last-minute changes resulted in delay. It was expected that both Buick and Oldsmobile would use the transmission, which is semi-automatic, having two speed ranges and two completely automatic shifts in each range. Under certain conditions of operation, the sales department explains, a "super-drive" feature makes gear shifting entirely automatic without the use of the clutch.

Detroit lost another industrial concern Friday when the Yale & Towne Mfg. Co. announced that it was discontinuing its Detroit plant which had employed 500 workers until it was closed by a strike May 9. The plant had manufactured automotive locks here since February, 1934. Last week the Crown Hat Mfg. Co. closed permanently as the result of labor trouble.

Water Equipment Manufacturers Agree

(CONTINUED FROM PAGE 69)

works valve and hydrant group against whom the order is directed are as follows:

American Foundry & Mfg. Co., St. Louis; Bourbon Copper & Brass Works, Cincinnati; Cambridge Machine & Tool Co., Cambridge, Mass.; Chapman Valve Mfg. Co., Indian Orchard, Mass.; Columbian Iron Works, Chattanooga, Tenn.; Crane Co., Chicago; Darling Valve & Mfg. Co., Willamsport, Pa.; Eddy Valve Mfg. Co., Troy, N. Y.; Fairbanks Co., New York; Filer & Stowell Co., Milwaukee; Iowa Valve Co., Oskaloosa, Iowa; Jenkins Brothers, Bridgeport, Conn.; Johnson City Foundry & Machine Co., Inc., Johnson City, Tenn.; Kennedy Valve Mfg. Co., Elmira, N. Y.; Ludlow Valve Mfg. Co., Troy, N. Y.; M. & H. Valve & Fittings Co., Anniston, Ala.; Manistee Iron Works Co., Manistee, Mich.; Michigan Valve & Foundry Co., Detroit; Ohio Injector Co., Wadsworth, Ohio; Pacific States Cast Iron Pipe Co., Provo, Utah; Reading-Pratt & Cady Co., Bridgeport, Conn.; Rensselaer Valve Co., Troy, N. Y.; Rich Mfg. Co., Los Angeles; A. P. Smith Mfg. Co., East Orange, N. J.; South Park Foundry & Machine Co., St. Paul; Traverse City Iron Works, Traverse City, Mich.; Walworth Co., New York; Waterous Co., St. Paul; Western Gas Construction Co., Ft. Wayne, Ind.; R. D. Wood Co., Philadelphia; W. E Malpass

PARTNERS THREE

Man, Metal, Machine—all must cooperate to maintain top quality in the production of screw parts.

To utilize the full efficiency of the skilled operator, give him good tools to work with, and good materials to work on—the latest type of automatic screw machine *plus* Ultra-Cut Steel—what a combination!

Ultra-Cut offers to the metal working industry a new opportunity to pare down costs by accelerating spindle speeds and rates of feed.

Average increases of 30% to 40% in output are obtained by substituting Ultra-Cut for standard grades of screw stock. We say average, because under favorable conditions, production is often doubled.

More parts per hour with equal or greater tool life—and no sacrifice of quality, for Ultra-Cut machine parts show consistently good character.

All Ultra-Cut asks is an even break—give it a tryout on your automatics. In scores of plants, trial runs have made many converts to Ultra-Cut Steel.

Folder will be sent on request, showing actual production records and details

COLD DRAWN BARS
GROUND SHAFTING
EXTRA WIDE FLATS
SCREW STOCK
SPECIAL SECTIONS
ALLOY STEELS

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

and Mrs. Frank Bretz, trading as East Jordan Iron Works, East Jordan, Mich., and J. Roy Tanner, receiver for Pittsburgh Valve Foundry & Construction Co., Pittsburgh.

Explaining other provisions of the order, the Federal Trade Commission said:

"Rundle Spence Mfg. Co., Milwaukee, not a member of the Water Works Valve and Hydrant Group, is ordered to cease assisting any of the other companies in entering into and maintaining any price-fixing agreement.

"Denny and Moyers are ordered to discontinue, by means of intimidation, persuasion or any other method, inducing any of the respondents to raise prices quoted by them to the established uniform delivered prices.

"The complaint was dismissed as to Pittsburgh Valve & Fittings Co., Philadelphia, because of its dissolution in March, 1936; also as to H. M. Kessler, trustee in bankruptcy for the Vogt Brothers Mfg. Co., Louisville, Ky., Kessler having been discharged as trustee in August, 1935."

Bethlehem Awarded Three Large Ships

WASHINGTON, May 25.—The Bethlehem Shipbuilding Corp., low bidder, has been awarded a contract at $4,040,000 each for the construction of three modern, fireproof steamers for the Panama Steamship Co., owned and operated by the Government. Announcement of the award was made by Secretary of War Woodring last Thursday following a meeting of the board of directors of the Panama Railroad Co., which approved construction of the three vessels to replace the present fleet of three ships, and authorized acceptance of the Bethlehem bid. Plans and specifications for the three ships were prepared by Naval Architect George G. Sharp and were approved by the Department of Commerce and the Navy Department.

Says Merchant Marine Must Be Built Up

SPEAKING at the National Maritime Day celebration of the fifteenth anniversary banquet of the Propeller Club of the United States at the Hotel Astor, New York, last Saturday, Chairman Joseph P. Kennedy of the United States Maritime Commission said that so far as the shipbuilder is concerned it must be frankly recognized that the new Merchant Marine Act represents an effort to subsidize this industry.

"This has not been done because the administration has a particular affection for the ship construction companies of this country," said Mr. Kennedy. "Not at all. It was done because a realistic Congress recognized that in the scheme of national defense, as well as for the proper assurance of replacements of our merchant marine, the preservation of the shipbuilding industry must be maintained. And shipyards to be really maintained must be used as well as equipped. They must not rust while they wait—they must be going concerns."

He proceeded to say that under the act, the Government is permitted to enter the ship construction industry, if necessary, to stop profiteering.

35-Hr. Work Week May Be Urged Under Black-Connery Labor Bill

WASHINGTON, May 25.—The general view of the Black-Connery hour and wage bill introduced yesterday in Congress immediately following Presidential recommendation for such legislation at the present session of Congress is that it is not "unduly oppressive." The opinion was qualified, however, with the statements that the effect on industry of the law, if enacted—and it is expected that it will be—will depend to a large extent upon its administration. It is to be administered by a five-man Labor Standards Board, which would be authorized to fix "fair hour and wage levels and to take into consideration geographical as well as competitive conditions in deciding such levels." It therefore would be authorized to adjust hours on a flexible rather than a rigid basis. The bill authorizes appointment of the board by the President.

Seemingly, on the face of it, the bill would have no particular bearing on such basic industries as steel, metalworking and automobiles, though certain conditions as to labor relations might prove a source of difficulty in some instances. Primarily, its authors urge, and are supported in their views by the message the President delivered to Congress, the legislation is designed to wipe out practices followed by sweatshops and other industries paying low wages.

The bill, 40 pages long, introduced by Chairman Black of the Senate Committee on Labor and Education and Chairman Connery of the House Committee on Labor, appears to be carefully drawn to escape constitutional attack. It covers only business engaged in interstate commerce and clearly defines delegation of power given the Labor Standards Board by Congress.

Hearings Over in a Week

Hearings on the bill will begin next Monday, Chairman Connery said. He thinks they can be concluded within a week. The first witness will be Robert H. Jackson of the Department of Justice. Secretary of Labor Perkins also will be heard. Other witnesses will include John L. Lewis, chairman of the Committee for Industrial Organization; President William Green of the American Federation of Labor, and representatives of business.

The bill leaves blank the wage and hour stipulations. Representative Connery said he would urge the 30-hr. week bill, which both he and Senator Black have had before Congress for several sessions. However, he stated that he is willing to "compromise." There are reports that efforts will be made to fix a 35-hr. week. Such a reduction in hours obviously would have a violent effect on practically all major as well as the smaller industries and it is doubted that such a maximum work week will be set either in the bill after hearings or by the Labor Standards Board, as a basic

work week. Originally, the bill provided for a 40-hr. week and a minimum wage of 40c. an hr. The provision was finally left blank pending the closing of hearings. Payment of time and one-half for overtime is provided. Employment of children under 16 years of age is barred. The President's message indicated that he hopes States will enact similar legislation as it applies to all intrastate business.

The Black-Connery bill makes it clear that it differs from the old NRA in that the former, unlike the latter, gives wholly to the Federal Government control over wages and hours and it omits trade practices. It sets up specific limits within which wage and hour standards may be adjusted by the board upon acquainting itself with existing conditions in the different industries. This plan was pointed to by Mr. Connery to show that the board will not have any legislative powers but merely will carry out the will of Congress.

Provisions of the Bill

The bill does not relax the anti-trust laws. The only provisions which are in the nature of trade practice bar child labor and industrial espionage. Professional strike-breaking also is prohibited but this does not mean that employers are prohibited from hiring employees to replace strikers. Collective bargaining of course is required. Other provisions of the bill provide:

That Congress is oposed to "employment of workers under substandard labor conditions is interstate commerce."

A "fair" wage is one "fairly and reasonably commensurate with the value of the service or class of service rendered."

A reasonable work week includes "a number of hours of employment in a week which is reasonably suitable to the nature of the service or class of service rendered."

The wage and hour levels stipulated could be revised by the Labor Standards Board, if found necessary. Employment of professional strikebreakers or "sponsorship of industrial espionage" would be considered an "oppressive labor practice." So-called company unions would be barred.

This is in line with the following statement by the President in his message:

"And there should also be little dispute when it comes to ruling out of the interstate markets products of employers who deny to their workers the right of self-organization and collective bargaining, whether through the fear of labor spies, the bait of company unions, or the use of strikebreakers. The abuses disclosed by the investigations of the Senate must be promptly curbed."

Shipment in interstate commerce of any goods produced in violation of the terms of the bill would be definitely barred. Supreme Court decisions were cited to uphold the right of the federal government to prevent the movement of such goods.

So far as known, the administration did not confer with industrialists in connection with the legislation but the President did confer with organized labor leaders, including Mr. Lewis and Mr. Green, before proposing the program. Nevertheless, the principles of the legislation appear to have the approval of large sections of industry, provided their administration is not abused and the legislation is not used as a precedent to project the Government into widespread control of industry. It is felt that as it is, the Government will have its hands filled administering wage and hour standards—perhaps filled to overflowing.

Export of Scrap Has Created No Emergency, Says Government Committee

WASHINGTON, May 25.—The Interdepartmental Committee which has been studying legislation to license exports of iron and steel has unanimously reached the conclusion that the export movement of scrap has created no emergency situation and that there is no actual or prospective shortage of scrap.

Report to this effect has been made to the chairmen of the Senate and House committees on Military Affairs, Senator Sheppard of Texas and Representative Hill of Alabama, by Secretary of State Hull. Writing under date of May 18, he informed the heads of the committees that the analysis of the Interdepartmental Committee furthermore indicates that the disadvantages of direct and indirect restrictive action would outweigh the possible advantages.

"This report was unanimously agreed to by the executive committee on commercial policy and I believe has the concurrence of various interested departments," said Secretary Hull. "My study of the subject leads me to the same opinion.

"I am aware of the fact that the subject is one of continuing interest and importance and have given instructions that it should be followed with the greatest of care."

Reports also have been asked by the Senate and House Committees from the War, Navy and Commerce departments, which are included in the executive branches which make up the Interdepartmental Committee. It is understood that the Department of Commerce from the outset opposed the proposed scrap legislation and that while the War and Navy departments are said to have favored it, the report of Secretary Hull, head of the Interdepartmental Committee, makes it clear that they have joined other departments in opposition to the legislation at this time.

24,599 Visit Armco's "Open House"

ALL attendance records for Armco's "open house" programs were broken when 24,599 persons visited the Butler plant of the American Rolling Mill Co., during the four-day "open house" session.

Visitors were conducted through the plant along marked-off safety lanes, accompanied by experienced guides who explained the various operations. The "open house" attracted large groups of school children, women's clubs, employees from other industries, and the families of Armco's workers.

H. H. Kerr President Gear Manufacturers

THE election of officers of American Gear Manufacturers Association in a two-day convention at Galen Hall Hotel, Wernersville, Pa., resulted in naming of H. H. Kerr, president of Boston Gear Works, North Quincy, Mass., president; Howard Dingle, president Cleveland Worm and Gear Co., Cleveland, vice-president; and J. H. Jackson, vice-president of Jackson Gear Co., Pittsburgh, treasurer.

Crucible Signs SWOC Agreement Following Union's Victory at J&L

PITTSBURGH, May 25.—Important events on the labor front last week included a victory for the Steel Workers' Organizing Committee at the Jones & Laughlin Steel Corp.'s Government-supervised election, and signing of a modified Carnegie-Illinois type of agreement between the SWOC and the Crucible Steel Co. of America. The Crucible agreement recognized the SWOC as the agent for collective bargaining purposes on behalf of union employees, but did not materially affect the existing arrangements with regard to wages, hours, and other working conditions. A statement on the conference between F. B. Hufnagel, chairman, Crucible Steel Co. of America, and Philip Murray, chairman of the SWOC, follows:

"The Crucible Steel Co. of America, and its affiliated companies, the Pittsburgh Crucible Steel Co. and the National Drawn Steel Co., have signed a modified Carnegie-Illinois agreement with the Steel Workers' Organizing Committee recognizing the SWOC as the agent for collective bargaining for employees who are members of the Amalgamated Association of Iron, Steel and Tin Workers of North America, but not in effect materially changing the existing arrangements respecting wages, hours or other working conditions, even for employees who are members of the SWOC.

"This agreement binds only employees who have voluntarily become and are members of the Amalgamated Association of Iron, Steel and Tin Workers, and does not in effect materially change the existing arrangements respecting wages, hours, vacations or other labor conditions of any employees; nor has the company in any way impaired the legal rights of any of its employees under the National Labor Relations Act."

Victory for SWOC

The consent election held at the Pittsburgh and Aliquippa plants of the Jones & Laughlin Steel Corp. last week terminated in a better than 2-to-1 victory for the SWOC. Official counts showed 17,028 employees in favor of the SWOC, and 7207 employees against the SWOC. While these figures were for the company as a whole, unofficial reports indicate that the union won by about the same majority in both the Pittsburgh and Aliquippa plants. The election, which quietly took place from 6 a. m. last Thursday morning until 1 a. m. last Friday morning, was supervised by the National Labor Relations Board's regional director. Polling places were on company property and men were able to vote with little or no effect on production. There was no disorder at the 46 polling places where a representative from the company, one from the SWOC, and one from the Government, supervised the eligibility of each voter. The company had previously furnished the NLRB regional director with a list of eligible voters and before each man cast his ballot, his name was checked against the official list. The number of void, blank, and challenged ballots was negligible. The ballots were counted within six hours after the polls had closed.

In commenting on the settlement of the collective bargaining issue, the company said:

"The Jones & Laughlin Steel Corp. is gratified that such an important issue has been so amicably settled by peaceful and democratic methods, under the provisions of the Wagner Act."

The SWOC heads hailed the victory as spelling universal collective bargaining in the steel industry.

How SWOC Will Proceed

SWOC tactics with regard to other independent companies which have signified unwillingness to enter into written agreements can be summed up as follows:

1. Offering of a written contract similar to that signed by U. S. Steel Corp. subsidiaries, in which the agreement is on behalf of union members only.

2. Request for a consent election in which the steel company agrees to a Government-supervised election in which the employees will decide whether or not they want the SWOC as their collective bargaining agent. The consent election is more expeditious than one obtained through petitioning by union employees of the NLRB.

3. In case the above requests are not met, the SWOC will, in all probability, call a strike.

Some action is expected to be forthcoming this week either from the SWOC or from the other large independents which so far have resisted any attempt to bring about a written contract. It is interesting to note that not only was the Jones & Laughlin election one of the largest Government-supervised elections to be held under the Wagner Act, but it also involved the company which was responsible for the Supreme Court decision of the Wagner Act as far as the steel industry is concerned.

J. & L. Signs Contract

A written agreement between the Steel Workers Organizing Committee and the Jones & Laughlin Steel Corp. naming the union as sole collective bargaining agent for employees, was signed today. This action is in accordance with terms agreed upon between the company and the union previous to the holding of last week's election. The contract is substantially the same as standard agreements signed by other steel companies with the exception of the exclusive bargaining feature. The Jones & Laughlin contract is the major one of its kind in the steel industry.

A Government-supervised election is taking place today at the plants of the Sharon Steel Corp., and employees of Pittsburgh Steel Co. will vote on the sole collective bargaining question June 9 and 10.

Farm Implement Sales Increasing

INCREASED buying power in agricultural areas is boosting sales records of farm implement manufacturing plants. That industry reports increases over last year of from 30 to 50 per cent, and an estimated total yearly volume of sales amounting to as much as $575,000,000 to $600,000,000. About 123,000 persons are now engaged in this field, as compared with 99,976 in June 1929, the previous high. Payrolls are climbing, too, the weekly average for February having been $2,821,000, while the best previous weekly payroll average was $2,057,000 in June, 1929. Last year total sales amounted to $445,135,000. The all-time high was $570,000,000 in 1929, which figure, according to present indications, may be exceeded in 1937.

Light-Weight Steels Used On All Cars Would Save Railroads Large Sum

IF it were possible to eliminate one-fourth of the weight from the 1,745,299 freight cars owned by American railroads, a saving of $154,000,000 would be effected in their operating costs during the current year, Albert F. Stuebing, railroad mechanical engineer of the United States Steel Corp., told the New York Railroad Club in the main auditorium of the Engineering Societies Building, 29 West 39th Street, May 21.

Mr. Stuebing was quoting Ralph Budd, president of the Burlington Lines, who had recently compiled some figures based upon estimates of the Car Service Division of the Association of American Railroads.

Quoting Mr. Budd further, Mr. Stuebing continued: "The cost per ton-mile of moving these cars, not counting their contents, is estimated to be 1.13 mils.

"If these cars weighed one-fourth less, there would be a saving of 113,561,806,000 ton-miles which, at 1.13 mils per ton-mile, would amount to $128,324,840.

"Following the assumption that 1937 would see 20 per cent more business moving, the saving this year could total $153,989,808 were it possible overnight to reduce the weight of all freight cars by one-fourth."

Stronger steels are the answer to the problem of reducing deadweight to cut railroad operating costs, Mr. Stuebing declared.

Since their introduction in 1934, high-tensile steels have made phenomenal headway in railroad transportation. At the close of the last year, 23 different railroads had used Cor-Ten in more than 10,000 freight cars, in some instances reducing their tare, or deadweight, by 20 per cent. As a result, revenue per car has been increased by as much as 8 per cent with no increase in operating costs.

Frank R. Layng, chief engineer of the Bessemer & Lake Erie Railroad, told about recent developments in rails.

The Bessemer & Lake Erie, a subsidiary of the United States Steel Corp., is experimenting with long welded rails to determine their practicability from the standpoint of service and economy. "Although quite definitely in the experimental stage, we can say that so far no failure has developed in the period of one year and a half since the installation of these welded rails," said Mr. Layng.

"Probably the greatest problem has been that of controlling the expansion and contraction of steel rails during the wide temperature ranges between summer and winter. We found we could accomplish this only with a positive type of fastening which holds the rails to the ties with sufficient force to control expansion and contraction."

J. R. Mills, New York district sales manager of Carnegie-Illinois Steel Corp., was chairman of the meeting.

British Steel Prices Stabilized for 1937

LONDON (*Special Correspondence*).—The increased prices for iron and steel recently approved by the British Import Duties Advisory Committee are to remain operative until Dec. 31, 1937, giving a period of nearly eight months in which consumers can rely upon stable conditions. The price schedules now effective represent substantial advances over the previous quotations, being 25s. ($6.25) per ton in the case of hematite iron and rising to £1 17s. 6d. ($9.36) for steel plates, sections, and joists.

Generally speaking, the advances are in the neighborhood of 20 per cent and are much smaller than would have been the case had the industry not been subject to the control which has become part of its national organization.

Provision has been made in the new schedules for the greatly increased prices which have had to be paid in connection with the large purchases made abroad by the British Iron and Steel Corporation of pig iron and scrap in order to supplement domestic supplies. As these purchases had to be made in the face of a world shortage, they involved the payment of exceptionally high prices. In connection with the purchases of scrap steel, on a basis of about 30s. ($7.50) per ton above the ruling prices for domestic scrap, the difference is to be borne by all consumers.

British producers have been faced with rising raw material prices for several years. Taking values in 1932 as a standard of 100, foreign ore has risen to 147, coke to 205, and scrap to 186. Therefore an advance of 20 per cent in the price of the products of the industry cannot be regarded as excessive. The price policy of the industry may be described as one of studied moderation.

Continental members of the European Steel Cartel have for a considerable time past wished to advance export quotations for finished products, but British interests have proved a severely restraining influence. The British Iron and Steel Federation aims at pursuing a policy which has regard for national and consuming interests rather than a commercially selfish one.

Develops New Steel For Turbine Blading

THE discovery of a new steel, possessing special suitability for high temperature turbine blading, was announced by W. H. Hatfield at the recent Congress of the International Association for Testing Materials in London. The discovery is the result of intensive and continuous research at the Sheffield laboratories with which Dr. Hatfield is associated. The new steel, known as Stayblade Max, has high chromium and nickel contents and also substantial additions of titanium and aluminium.

Dr. Hatfield states that its "time yield" value at 550 deg. C. is as high as 9½ tons per sq. in., and thus it will be suitable for working under fairly severe stress at temperatures up to and including those of a red heat.

The new steel is of the austenitic type; it can be formed into various sections, and is quite machineable. It is, in fact, already being tried in high temperature turbines in the form of blading. The fact that it resists oxidation in air or steam up to temperatures as high as 900 deg. C. renders it very suitable for use under especially high superheat conditions.

Price Reduced on Inconel-clad Steel

A LOWER base price of 25c. per lb. for Inconel-clad steel has been announced by Lukens Steel Co., Coatesville, Pa. A new list of standard extras has also been issued. Inconel is an alloy of nickel, chromium and iron, with approximately 78 to 80 per cent nickel, 12 to 14 per cent chromium, and 6 to 8 per cent iron.

American Steel Workers Toil Less For Food Than Foreign Workers

TO earn enough to fill a market basket with food, American steel employees work only a fraction as long as steel workers in other countries, according to calculations by the American Iron and Steel Institute.

A dozen eggs, a pound of bacon, a loaf of bread, a bottle of milk, and other items, can be bought by American steel workers with the money earned for only 1½ hr. of work.

Steel workers in various representative foreign steel-producing nations would have to work much longer to buy the same quantity and kinds of foods at the level of wages and food prices in those countries, according to data published by the International Labor Office. In England the time required would be 3¾ hr., in Germany 7 hr., and in Belgium 14 hr.

Higher wages paid to employees of the American steel industry, which last year were 140 per cent above the average hourly earnings of foreign steel workers, more than compensate for any differences between domestic and foreign prices for various foods. American industrial workers, therefore, can spend a smaller proportion of their total earnings for food than foreign workers, and yet enjoy a wider variety of foods.

One pound of bacon and a dozen eggs can be bought by steel workers in Pittsburgh for the money they earn for only 36 min. work, while Belgian steel workers would have to work 6½ hr. to buy the same things. Steel workers in Germany would have to work 3½ hr., and the English 2 hr., the calculations show.

For the money equivalent of only 14 min. of work, the American steel worker can buy a pound of bread and a quart of milk, while in Belgium nearly an hour of work would be needed, in Germany 35 min., and in England a little less than a half-hour.

A pound of beef can be bought by steel employees in this country for the money earned by 12 min. work, which compares with 20 min. of work by English steel workers, 38 min. in Germany and nearly two hours in Belgium. To earn enough to buy a pound of potatoes, the Belgian steel worker works for 7 min. and the German and English workers for 3 min. In this country steel employees need only to work 2 min. to earn the price of a pound of potatoes.

A pound of butter in Belgium costs the equivalent of 4 hr. of work, in Germany nearly 2 hr., in England almost an hour, and in this country only 26 min.

To earn a pound of sugar the German steel worker must work half an hour, the Belgian almost three-quarters of an hour, and the British 8 min. American steel workers, however, can buy a pound of sugar for less than 4 min. of work.

. . TRADE NOTES . .

Kinzig Tool Co., Cleveland, has taken over larger quarters at 1922 East 66th Street.

Cleveland Metal Abrasive Co., Cleveland, recently incorporated by O. S. Stewart to manufacture steel shot and grit abrasives, is operating at 887 East 65th Street.

Cutler-Hammer, Inc., Milwaukee, has opened a new sales office at 624 Santa Fe Building, Dallas, Tex.

W. A. Jones Foundry & Machine Co., manufacturer of speed reducers, gears, and transmission appliances, announces that its Buffalo office, in charge of Frank W. Stuker, is now located at 361 Delaware Avenue, in the Curtiss Building.

Little Giant Co., Mankata, Minn., has been sold at foreclosure sale to a new company, which has been incorporated as Little Giant, Inc., with L. J. Fazendin, president; C. R. Butler, vice-president and treasurer, and G. J. Hodapp, secretary. The new company will continue the former company's business in the manufacture of power hammers and machine tools, and will also manufacture for a subsidiary, the Fuller Mfg. Co., a line of plumbing supplies.

Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., has completed additions to its plants which will enable it to manufacture abrasive wheels by the vitrified, resinoid and silicate processes.

Consolidated Machine Tool Corp., Rochester, N. Y., has opened new offices in Philadelphia and New York. A. Meyers is the New York representative at 50 Church Street, and R. L. Arms will handle sales and service for the Philadelphia district from 105 Los Angeles Avenue, Fox Chase, Philadelphia.

Curtis Pneumatic Machinery Co. and **Curtis Refrigerating Machine Co.**, New York, have moved to larger quarters at 30 Vesey Street.

Kloster Steel Corp., Chicago, will move to new quarters at 224-228 North Justine Street on June 1.

Pressed Steel Tank Co., Milwaukee, will move its offices to 1437 South 66th Street early in June.

EMPLOYEES at Jones & Laughlin Steel Corp. balloting on whether they wanted the Steel Workers Organizing Committee as their collective bargaining agent. Peculiarly, it was the Jones & Laughlin case before the National Labor Relations Board which led to the Supreme Court decision on the Wagner act and the scene portrayed in this picture is a fitting end to the cycle set in motion.

—International News Photo.

Amount of Steel in Use Tops Billion Tons for First Time

THE total tonnage of steel in use in this country, in all forms, has topped the one billion-ton mark for the first time in history, according to the American Iron and Steel Institute. The total represents an average of 17,800 lb. in use for every person in the country.

If all the steel now in use were to be sold as scrap at present prices its value would approximate $18,500,000,000, or a sum greater than the entire stock of money, including stocks of gold and silver bullion, and currency in circulation, in the United States. Several times that amount of money would be required to replace the nation's stock of steel with new steel.

About 954,000,000 tons of steel were in use during 1935, equivalent to about 17,000 lb. per capita. The increase in 1936 represents not only the production of steel ingots during the year, but also reflects the great tonnages of steel still in use that were put into "permanent" services, such as bridges, buildings and pipe lines, during the early years of the century. In addition, the life of steel is becoming increasingly longer as a result of progress in manufacturing, fabricating and preserving. Because of the longer life, the tonnage of steel taken out of service last year was less than in preceding years.

The estimated tonnage of steel in use includes the weight of the steel in skyscraper skeletons, dams, railroad trains and such other massive steel-built structures, and likewise includes the amount of steel in automobiles, paper clips, carving knives and the multitude of other uses of steel.

In 1900 about 2600 lb. of steel were in use per capita in this country, and during the succeeding 30 years the tonnage in use increased steadily at the rate of about 440 lb. per capita per year, amounting to 8100 lb. per person in 1915, and 15,400 lb. in 1929.

In 1931, under depression conditions, the increase per capita was only 70 lb. In 1932, when steel output was at the lowest level in 30 years, production failed to keep pace with the growth in population, with the result that at the end of 1932 only 15,890 lb. of steel were in use per capita, compared with 16,010 lb. in the year before.

The average annual increase in steel in use per capita since 1932 has been 480 lb. per year, more than 9 per cent above the average between 1900 and 1930.

Estimate of the total tonnage of steel in use is obtained by calculating the cumulative yearly totals of steel produced and scrapped since 1865 when steel was first made in large tonnages.

National Supply Co. of Delaware and subsidiaries, including Spang, Chalfant & Co., Inc., for the March quarter report net profit of $2,644,750, equal after allowing for quarterly dividend requirements on preferred stock, to $6.15 per share of common. This compares with net profit of $493,282, or 53c. a share of common, in the March quarter of 1936.

Spang, Chalfant & Co. and subsidiary report for March quarter net profit of $1,956,042, equal, after dividend requirements, to $2.35 a share of common stock. This compares with $313,522, or 16c. a share on common, in the March quarter of 1936.

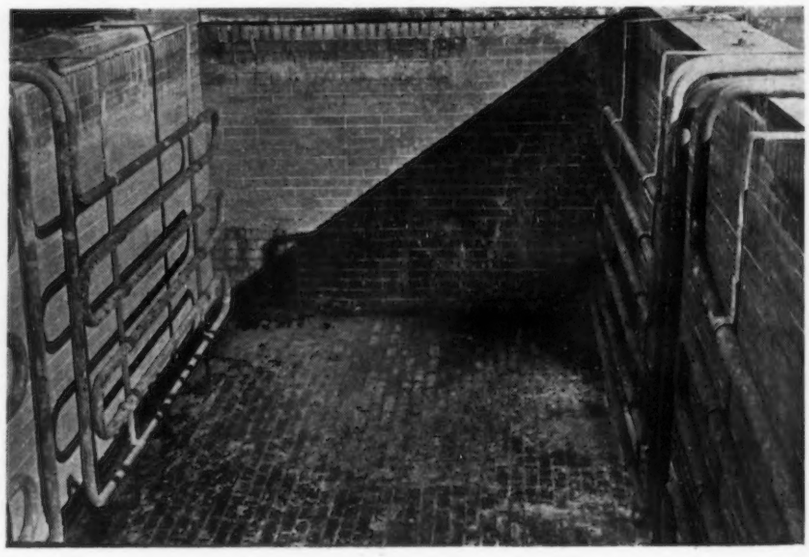
Waste Pickle Liquor Evaporated in Rubber-Lined Tank

A LARGE Ohio manufacturer was faced with the problem of disposing of its waste sulphuric pickle liquor. A system was devised whereby the liquor was piped to a large outdoor tank. Here, by means of steam coils, it was held at a temperature of 210 to 220° F. until completely evaporated.

The original installation consisted of a large concrete tank. This did not prove satisfactory, however, due to the fact that the concrete was constantly cracking from contraction or expansion, permitting waste liquor to leak out onto the ground which caused an undesirable working condition.

This tank was replaced in July, 1936, with a 6500-gallon steel tank of all-welded construction which was lined with a ¼-in. thickness of Triflex rubber. This lining, which is a product of The B. F. Goodrich Company, consists of a layer of hard rubber vulcanized between two layers of soft rubber. It is provided with built-in expansion joints which permit lining to contract or expand without danger of cracking. As a protection against excessive heat or physical damage, lining is covered with a special brick sheathing.

During the six months tank has been in service no difficulty whatsoever has been experienced with leaks. Due to the fact that the tank has no overhead protection, it is planned to maintain a low steam pressure in the coils throughout the winter months while tank is empty to prevent any water which might collect from freezing and causing damage.



FABRICATED STEEL

. . . Lettings advance to 17,200 tons from 16,700 tons last week.

o o o

. . . New projects in good volume at 35,425 tons as against 27,425 tons a week ago.

o o o

. . . Plate awards call for 600 tons.

NORTH ATLANTIC STATES

Boscawen-Canterbury, N. H., 200 tons, State bridge, to American Bridge Co.

Lowell, Mass., 1063 tons, State bridge, to American Bridge Co.

Huntington, Mass., 330 tons, State bridge, to Bethlehem Steel Corp.

Ware, Mass., 134 tons, State bridge, to Bethlehem Steel Corp.

Enfield, Conn., 100 tons, St. Francis infirmary building, to Haarmann Steel Co., Holyoke, Mass.

New York, 3300 tons, Sixth Avenue subway, route 101, section 6, West Ninth to West 18th Streets, to American Bridge Co.

Jordan, N. Y., 230 tons, grade crossing elimination, New York Central Railroad, to American Bridge Co.

Endicott, N. Y., 225 tons, elementary school, to an unnamed fabricator.

Suffern, N. Y., 300 tons, Good Samaritan Hospital building, to Joseph T. Ryerson & Son, Inc.

Glendale, N. Y., 350 tons, Long Island Railroad bridge, to Bethlehem Steel Corp.

Rochester, N. Y., 235 tons, American Nepheline Corp., to Genesee Bridge Co., Rochester.

Buffalo, 180 tons, Buffalo General Hospital addition, to Buffalo Structural Steel Co., Buffalo.

Elizabeth, N. J., 550 tons, grade crossing elimination bridge, to Bethlehem Steel Corp.

Chadds Ford, Pa., 500 tons, highway bridge, to Bethlehem Steel Corp.

Reading, Pa., 385 tons, Parish Pressed Steel Co. addition, to Belmont Iron Works, Philadelphia.

Holtwood, Pa., 380 tons, Pennsylvania Water & Power Co., divided between Blaw-Knox Co., Blawnox, Pa., and Lehigh Structural Steel Co., Allentown, Pa.

Baltimore, 160 tons, crane runway for Crown Cork & Seal Co., to Acme Steel Co., Chicago.

Baltimore, 145 tons, building addition, to Dietrich Brothers, Baltimore.

SOUTH AND SOUTHWEST

Lexington, Ky., 170 tons, junior high school, to International Steel & Iron Co., Evansville, Ind.

Major County, Okla., 125 tons, bridge, to Capitol Steel & Iron Co., Oklahoma City.

CENTRAL STATES

Detroit, 590 tons, General Motors diesel division, to R. C. Mahon Co., Detroit.

Detroit, 380 tons, Plymouth machine shop addition, to Whitehead & Kales Co., Detroit.

Detroit, 115 tons, Great Lakes Steel Corp., crane beams and stops, to American Bridge Co.

Harrison County, Ohio, 130 tons, highway bridge, to Burger Iron Co., Akron, Ohio.

Cincinnati, 170 tons, foundry addition for Lunkenheimer Co., to Bethlehem Steel Corp.

Toledo, Ohio, 135 tons, City Auto Stamping Co., to Whitehead & Kales Co.

Chicago, 460 tons, Hyde Park school addition, to Duffin Iron Co., Chicago.

Chicago, 130 tons, boiler supports, Combustion Engineering Co., to Bethlehem Steel Corp.

Lafayette County, Wis., 220 tons, bridge, to Milwaukee Bridge Co.

State of Wisconsin, 135 tons, bridge, Spring Green-Reedsburg Road, to A. C. Woods Construction Co.

Ord, Neb., 500 tons, flume supports, North Loup River Public Power & Irrigation District, to St. Joseph Structural Steel Co.

WESTERN STATES

Seattle, 3500 tons, Puget Sound Pulp & Timber Co., to Isaacson Iron Works, Seattle.

Hollywood, Cal., 1400 tons, Hollywood Turf Club, to Bethlehem Steel Corp.

Spokane, Wash., 250 tons, building for Brown Brothers, to Isaacson Iron Works.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

North Kennebunkport, Me., 400 tons, State bridge.

Goffstown-Henniker, N. H., 140 tons, two State bridges.

Braintree, Mass., 300 tons, bridge.

Milford, Mass., 150 tons, State bridge.

Hartford County, Conn., 350 tons, Bills Brook dam.

New York, 1200 tons, contract WB-2, Bronx-Whitestone bridge, New York Port Authority.

New York, 3800 tons, express highway viaduct, New York Central Railroad.

Flushing, N. Y., 350 tons, city garage.

Lockport, N. Y., 1100 tons, building, Harrison Radiator Division, General Motors Corp.

Albany County, N. Y., 300 tons, State grade crossing elimination.

Rochester, N. Y., 800 tons, boiler house extension, Rochester Gas & Electric Co.

Tonawanda, N. Y., 500 tons, New York Central grade crossing elimination; bids June 1.

Weehawken, N. J., 2700 tons, contract MHT-23, Lincoln Tunnel, New York Port Authority.

Passaic County, N. J., 300 tons, grade crossing elimination.

Harrisburg, Pa., 700 tons, farm show arena, General State Authority.

Ambler, Pa., 800 tons, Keasby & Mattison Co. plant unit.

SOUTH AND SOUTHWEST

Dallas, Tex., 500 tons, Southern Methodist University library.

New Orleans, 11,000 tons, Charity hospital building.

Shiprock, N. M., 1200 tons, State highway bridge over San Juan River; bids taken.

CENTRAL STATES

Cleveland, 400 tons, factory building.

Zanesville, Ohio, 350 tons, mill building, American Rolling Mill Co.

Flint, Mich., 3800 tons, press shop, girders, and storage building, Fisher Body Division, General Motors Corp.

State of Indiana, 760 tons, bridge; bids June 1.

Rockford, Ill., 127 tons, Ingersoll Milling Machine building; bids May 27.

La Grange, Ill., 2000 tons, Electro-motive Corp. plant addition.

Chicago, 250 tons, Dennison Mfg. Co. building.

Cape au Gris, Mo., 4000 tons, dam No. 25 in Mississippi River; United Construction Co., Winona, Minn., low bidder on general contract.

WESTERN STATES

Helena, Mont., 247 tons, bridge over Flathead River; bids May 28.

Victor, Colo., 400 tons, Pine Creek bridge for Bureau of Public Roads.

Odair, Wash., 1000 tons, trash racks, specification No. 739, Bureau of Reclamation.

Portland, Ore., 590 tons, State highway bridge over Quartz Creek; bids June 3.

FABRICATED PLATES

AWARDS

Harrison, N. Y., 175 tons, Westchester joint waterworks, standpipe, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Chicago, 200 tons, steel pipe, to Alco Products Co., Dunkirk.

Decatur, Ill., 225 tons, coal chute, to Mississippi Valley Structural Steel Co., St. Louis.

SHEET PILING

AWARDS

Norfolk, Va., 345 tons, Naval Supply Depot, to Carnegie-Illinois Steel Corp.

NEW PROJECTS

Attica, N. Y., 350 tons, cell block for State prison.

Cape au Gris, Mo., 7000 tons, dam No. 25 in Mississippi River; United Construction Co., Winona, Minn., low bidder on general contract.

Problems Face Steel Warehouse Operators, Declares R. J. Stayman

SPEAKING before the 28th annual convention of the American Steel Warehouse Association at White Sulphur Springs, W. Va., R. J. Stayman, president of the association, discussed the problems facing the steel warehouse operators. The ever changing political and economic situation has made unceasing diligence necessary for profitable and progressive management of warehouses, he pointed out.

Discussing the labor problems facing the industry, Mr. Stayman said:

"You are all keenly aware of the rapid ascendency among warehouse problems of labor relations. I wish I could make some simple recommendation, or present some fundamental plan which would give you the clue to harmony and peace among your working forces. To be sure, certain requisites are primary. Good wages, reasonable working hours and decent working conditions. But how can reason cope with the phenomena of walkouts and sit-downs utterly devoid of objectives?"

W. S. Doxsey, executive secretary of the association, presented figures showing that dollar sales for the first four months of this year were 75 per cent ahead of the similar period last year. Mr. Doxsey's talk dealt intensively with the problem of controlling warehouse operating costs. Touching upon the influence of taxes on margin spreads, he said, "When we call your attention to the new surplus profits tax which takes from 7 to 25 per cent of undistributed earnings; the social security tax which calls for the equivalent of 1 per cent of your payroll, and the unemployment tax which is 2 per cent of your payroll, we have named only three of the new taxes and have omitted all consideration of the many tax increases both direct and indirect. As Mr. Stayman has said, there is only one way to obtain the money to pay for these taxes and that is through an increase in your gross margins."

P. F. Benedict, chairman of the foreign steel committee, reported a decrease in the amount of steel imports. This condition, he said, is caused by the increased consumption of European steel by European countries in providing for armament programs. Mr. Benedict further reported that the collector of customs has been investigating reported instances in which importers of foreign steel had removed identification tags from foreign shipments.

The need for detailed figures on the various economic factors of warehouse operation, was stressed by C. Dickerson, in an address "Some Problems of the Steel Distributers." Mr. Dickerson also discussed in detail the problem of compensating salesmen in a manner which would provide a financial cushion for the salesman in times of depression, and which would also provide an incentive for increased sales effort without creating too great a sales cost burden on the warehouse.

The meeting was held on May 26 and 27.

Turkey Forbids Export of Scrap

LONDON (*Special Correspondence*).—The Turkish Government has forbidden the exportation of scrap metals, expecially iron. This step has been taken as a result of the fact that Turkey, although a large iron purchaser, has recently exported large quantities of scrap.

Turkey's iron requirements are increasing steadily and when the Karabuk steelworks start operations the entire scrap supply of the country will not be sufficient for its requirements.

Plans have been drawn to protect the Weirton Steel Co.'s Steubenville plant with a $250,000 flood wall. It will insure steady work to employees and uninterrupted production in the Steubenville plant, even though the Ohio River rises more than 2 ft. above the greatest flood stage reached. A pumping station of sufficient capacity will be erected on the inside of the wall to take care of the plant sanitation and sewage system when the river is at flood stage.

Frigidaire Expansion To Cost $4,000,000

THE erection of two new factory buildings together with enlargement and rearrangement of the Moraine City, Ohio, manufacturing facilities of Frigidaire Division, General Motors Corp., will be started within the next few weeks in preparation for 1938 production activities. The program will involve an expenditure in excess of $4,000,000 and will be the largest expansion of Frigidaire since the building of the present Moraine City plant in 1926.

Major improvement visible to outsiders will be a new building, 700 feet long, 80 feet wide and two stories high, facing west on Springboro pike, across the road and paralleling the present plant.

Steel in Pictures, A New Booklet

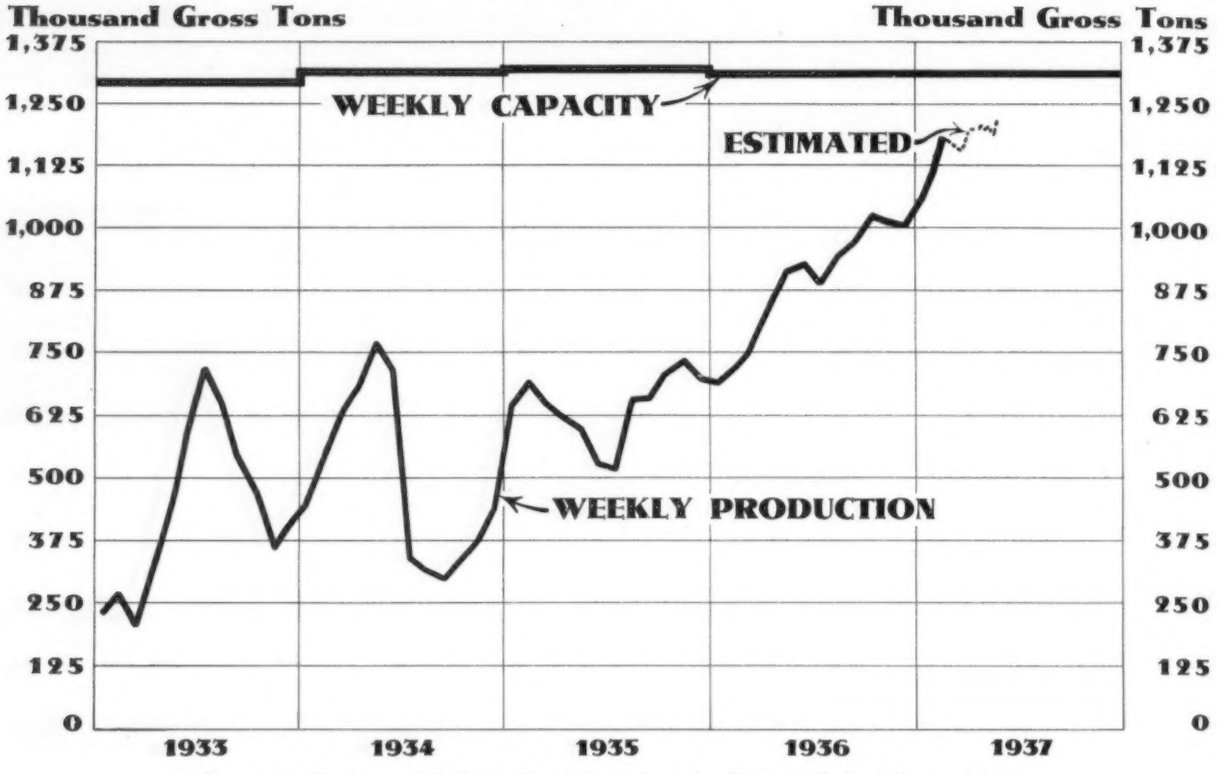
"THE Picture Story of Steel" is the title of a booklet published by the American Iron and Steel Institute for general circulation among teachers, students and others who desire to perfect their knowledge of how steel is made and used. The booklet is an innovation in its field, as none other just like it has ever been published. It consists of 48 pages on coated paper, on which the illustrations show up to best advantage. Each page carries one or more illustrations, with appropriate text in non-technical language so that a student in the grade schools could easily acquire an understanding of the various steel making processes.

Starting with the ore, the booklet shows an open pit mine in the Lake Superior district, then shows the surface equipment of a coal mine, with an explanation of the importance of coal in steel production; there are pictures of a limestone quarry, a pile of scrap in a steel mill yard, a coke oven, a blast furnace, an open-hearth furnace, the charging of scrap and limestone into the open hearth, a Bessemer converter, the pouring of molten steel into the ingot molds, and so on through the various rolling processes, and, finally, illustrations on the way steel is used in the home, on the farm, in transportation, in construction and in industry.

Copies of the booklet may be obtained without charge by writing to the American Iron and Steel Institute, 350 Fifth Avenue, New York.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week
Pittsburgh	93.0	95.0
Chicago	86.0	86.0
Valleys	84.0	86.0
Philadelphia	71.0	71.0
Cleveland	80.0	87.0
Buffalo	94.0	86.0
Wheeling	100.0	99.0
Southern	74.0	75.0
Ohio River	88.0	90.0
Western	95.0	95.0
St. Louis	93.0	90.0
Detroit	100.0	100.0
Eastern	98.0	98.0
Aggregate	91.0	92.0

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	May 25, 1937	May 18, 1937	April 27, 1937	May 26, 1936	1937	1936
Fabricated structural steel awards	17,200	16,700	12,550	11,900	498,015	429,650
Fabricated plate awards	600	320	2,495	555	58,015	124,685
Steel sheet piling awards	345	0	180	0	16,875	16,975
Reinforcing bar awards	2,235	1,410	5,900	5,760	87,105	156,480
Total Lettings of Construction Steel	20,380	18,430	21,125	18,215	660,010	727,790

. . . SUMMARY OF THE WEEK. . . .

. . . Evidences of seasonal decline in demand, particularly from automobile industry.

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. . . Ingot production, at 91 per cent, promises to hold up through June at least.

o o o

. . . Labor situation an uncertain factor as SWOC presses for signed agreements.

SEASONAL influences are now more plainly at work in steel demand, though consumption is still holding up strongly in all important lines except the automobile industry, where the approaching changeover to 1938 models is bringing production of parts for 1937 cars to an end. However, steel orders from automobile companies for new models will soon be increasing. For example, a purchase by the Ford Motor Co. for 50,000 new cars is expected next week, and in June that company will buy sheets for a production schedule of 250,000 cars.

Although aggregate orders for steel have been running about 75 per cent of current shipments, the pressure from consumers for deliveries has been relaxed to such an extent that much earlier shipments of some products are possible than could be obtained until very recently. Thus, a company that has a two- or three-months' backlog in a certain product may be able to make shipment of new orders within a few weeks because of open spaces that unexpectedly develop in rolling schedules. This condition gives some buyers a false idea of present mill backlogs, which in some instances are still so large that deliveries of two or three months are not uncommonly quoted. Some steel companies loaded up more heavily on forward orders than did others, with the result that the delivery situation is more mixed than heretofore.

Backlogs are heaviest in tin plate, structural shapes, plates, bars and coated sheets, while deliveries have eased up most noticeably in cold-rolled sheets and hot-rolled strip, a reflection of the lighter current demand from the automobile industry.

STEEL ingot output is slightly lower this week at 91 per cent, compared with an estimated 92 per cent last week. The Pittsburgh area has dropped two points to 93 per cent, the Cleveland-Lorain district is down seven points and the Youngstown district three points. Offsetting these declines, the Chicago rate holds at 86 per cent, the Wheeling district is up a point to 100 per cent, and Buffalo is running at 94 per cent, a gain of several points. At Gary, Ind., the Carnegie-Illinois Steel Corp. has put on bessemer capacity that has not been operated since 1930. These changes indicate the spottier condition that has developed in the steel market.

Barring the possibility of shutdowns caused by strikes at some independent steel plants, there appears to be no likelihood of any sharp reduction in steel output during June. The signing of a contract by Crucible Steel Co. of America similar to that executed with subsidiaries of the United States Steel Corp., wherein the CIO is recognized as the bargaining agency for its own members only, together with the CIO victory at the plants of the Jones & Laughlin Steel Corp., makes it appear that the labor organization may modify its recalcitrant position in stating that strikes would be called if agreements were not signed. Inland Steel Co. on Tuesday refused to sign a contract, although agreeing to recognize the CIO as the bargaining agency for its members.

PIG iron prices for the third quarter will be announced shortly, probably without change. While the indications are good for sustained foundry melt during the summer, advance buying may not be large because of the lack of price incentive. Iron ore water shipments in May, at more than 9,000,000 tons, will break all records for the month except in 1929, when the total was upward of 9,500,000 tons.

The decline in steel scrap prices, which has been continuous for seven weeks, appears to have hit bottom, temporarily at least. No important consumer demand has developed, as most large steel companies have one- to three-months' supply on hand, but brokers are no longer willing to sell in volume at prices now prevailing. THE IRON AGE scrap composite price, at $17.92, is unchanged for the first time since early April.

CONSTRUCTION work continues to furnish a substantial amount of steel orders, although some projects are held up because of uncertainties caused by labor disturbances and high wages for building labor. Lettings of 17,000 tons included 3500 tons for a paper mill at Seattle and 3300 tons for subway work in New York. New projects of 35,500 tons are headed by 11,000 tons for a hospital in New Orleans, 3800 tons for a highway viaduct in New York, 3800 tons for a Fisher Body Co. plant in Detroit, 2700 tons for the Lincoln tunnel, New York, and 2000 tons for a General Motors subsidiary at La Grange, Ill.

. . . PITTSBURGH . . .

. . . Ingot rate down at Pittsburgh but up slightly at Wheeling.

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. . . Orders show little change in total volume, averaging 75 per cent of shipments.

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. . . Large backlogs preclude possibility of nearby decline in aggregate output.

PITTSBURGH, May 25.—A slight scheduling downward of ingot production at some plants has brought the steel making rate in the Pittsburgh district down two points to 93 per cent of capacity, while Wheeling district operations have moved up one point to 100 per cent.

With incoming business fully equal to 75 per cent of shipments, coupled with the presence of fair-sized backlogs, there is little chance that the ingot rate in this district will show much further change for the next three or four weeks at least.

Total orders in the past week have shown little change from the previous period, but demand for hot rolled and cold finished bars has slipped off further. Semi-finished business is holding up well and some producers still continue to allocate tonnages. While structural plate and shape specifications are down slightly, the falling off is negligible, and the improvement in structural inquiries and awards, noticeable in the past few weeks, indicates a continuance of heavy products business. Aggregate sheet business shows no particular change from a week ago, and deliveries on all grades except light gage cold reduced remain quite extended.

Wire business is slightly better in the past week and tin plate operations continue at capacity.

American Bridge Co. will fabricate 1000 tons of plates and shapes for a chemical building at Norwood, Ohio, and it also received the award for 3300 tons of material for part of the Sixth Avenue subway in New York City.

Pig Iron

Although shipments continue heavy, new buying is proceeding on a hand-to-mouth basis. Should second quarter prices be reaffirmed, and this action is expected soon, pig iron buying might revert to the spot business practice invoked several months ago. Meanwhile, steel foundries are exceptionally busy and are far behind in their orders. There is little chance that total consumption of iron will show any material change for some time.

Semi-Finished Steel

Little, if any, change is apparent in semi-finished steel demand in the past week. Non-integrated sheet and tin plate mills are heavy consumers and this condition is not expected to change for several months, owing to heavy backlogs at these plants. Total bookings so far this month are ahead of the volume placed during the corresponding period last month.

Bolts, Nuts and Rivets

New business shows little change in the past week. Producers in this district have gone along with the price changes made elsewhere on hot-pressed and cold-punched nuts, the discounts for which are being reduced five points. Semi-finished hexagon nut discounts have been reduced 10 points and small rivets have been advanced about 10 per cent with the discount being changed from 70 per cent off list to 65 and 5 per cent off list. No formal action has been taken as yet on third quarter bolt prices. The changes mentioned above are effective now on all business not covered by contracts.

Bars

Incoming business has slipped off further in the past week and backlogs of four to six weeks are slightly easier. Part of the general leveling off is due to a slowing up in automobile purchases, and it is not expected that substantial orders from this direction will materialize before the next month or two. Considering all factors, the volume of incoming business is large enough to make the paring down of backlogs a slow process. Bookings so far this month are roughly about 30 per cent below the amount placed during the same period last month.

Cold-Finished Bars

Specifications are off further this week and it is not expected that any definite trend upward will materialize for several weeks. Automobile buying has dropped off and producers do not look for activity from this source until production plans for the 1938 models have been decided upon. Specifications from jobbers are lighter, reflecting a falling off in warehouse business. Backlogs are a little easier this week and new bookings for the most part are miscellaneous in nature.

Reinforcing Bars

Reinforcing bar awards have been light in the past week, but inquiries continue to be numerous. The Bronx-Whitestone bridge will require 1300 tons, while another large job involves 1100 tons at Chicago for a sewage treatment works. Meanwhile, deliveries are slightly easier.

Steel Sheet Piling

Carnegie-Illinois Steel Corp. has been awarded a contract for 345 tons of steel sheet piling for a naval depot at Norfolk, Va. An award is expected soon on the Keystone dam project requiring 9000 tons. Morrison-Knudsen Co., Boise, Idaho, is low bidder on the general contract. Action is also expected soon on Mississippi River dam No. 25, which will require 3100 tons.

Plates and Shapes

Structural plate and shape bookings continue to hold up exceptionally well. With demand for other finished products falling off, specifications for structural material are expected to be a mainstay in the market for the next few months at least. Meanwhile, inquiries in the past week, among which are several privately financed projects, are greater in number than for some weeks and involve a considerable tonnage. American Bridge Co. was awarded the contract for a chemical building at Norwood, Ohio, re-

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 25, 1937	May 18, 1937	Apr. 27, 1937	May 26, 1936
Rails, heavy, at mill	$42.50	$42.50	$42.50	$36.37½
Light rails, Pittsburgh	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	28.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	28.00
Slabs, Pittsburgh	37.00	37.00	37.00	28.00
Forging billets, Pittsburgh	43.00	43.00	43.00	35.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	1.85
Bars, Chicago	2.50	2.50	2.50	1.90
Bars, Cleveland	2.50	2.50	2.50	1.90
Bars, New York	2.78	2.78	2.78	2.20
Plates, Pittsburgh	2.25	2.25	2.25	1.80
Plates, Chicago	2.30	2.30	2.30	1.85
Plates, New York	2.53	2.53	2.53	2.09
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.80
Structural shapes, Chicago	2.30	2.30	2.30	1.85
Structural shapes, New York	2.5025	2.5025	2.5025	2.06¼
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.10
Hot-rolled strips, Pittsburgh	2.40	2.40	2.40	1.85
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.40
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.50
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.10
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.20
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	1.85
Hot-rolled sheets, No 10, Gary	2.50	2.50	2.50	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	2.95
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.05
Wire nails, Pittsburgh	2.75	2.75	2.75	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.15
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.45
Barbed wire, galv., P'gh	3.40	3.40	3.40	2.60
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.65
Tin plate, 100-lb. box, P'gh	$5.35	$5.35	$5.35	$5.25

Pig Iron

Per Gross Ton:	May 25, 1937	May 18, 1937	Apr. 27, 1937	May 26, 1936
No. 2 fdy., Philadelphia	$25.76	$25.76	$25.76	$21.3132
No. 2, Valley furnace	24.00	24.00	24.00	19.50
No. 2, Southern Cin'ti	23.69	23.69	23.69	20.2007
No. 2, Birmingham†	20.38	20.38	20.38	15.50
No. 2 foundry, Chicago*	24.00	24.00	24.00	19.50
Basic, del'd eastern Pa.	25.26	25.26	25.26	20.8132
Basic, Valley furnace	23.50	23.50	23.50	19.00
Malleable, Chicago*	24.00	24.00	24.00	19.50
Malleable, Valley	24.00	24.00	24.00	19.50
L. S. charcoal, Chicago	30.04	30.04	30.04	25.2528
Ferromanganese, seab'd, carlots	102.50	102.50	95.00	75.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$18.75	$18.75	$20.75	$14.25
Heavy melting steel, Phila.	18.25	18.25	19.75	12.25
Heavy melting steel, Ch'go	16.75	16.75	19.50	12.75
Carwheels, Chicago	19.25	19.25	20.75	13.50
Carwheels, Philadelphia	19.75	21.25	21.25	13.75
No. 1 cast, Pittsburgh	19.25	19.25	20.25	15.25
No. 1 cast, Philadelphia	20.25	20.75	22.00	14.00
No. 1 cast, Ch'go (net ton)	15.25	15.25	16.75	12.00
No. 1 RR. wrot., Phila.	19.75	19.75	19.75	14.75
No. 1 RR. wrot., Ch'go (net)	15.25	15.25	16.75	11.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.60	$4.60	$4.60	$3.65
Foundry coke, prompt	5.25	5.25	5.25	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	14.00	14.00	14.50	9.50
Lake copper, New York	14.12½	14.12½	14.62½	9.62½
Tin (Straits), New York	56.75	55.25	56.75	46.00
Zinc, East St. Louis	6.75	6.75	6.75	4.90
Zinc, New York	7.10	7.10	7.10	5.27½
Lead, St. Louis	5.85	5.85	5.85	4.45
Lead, New York	6.00	6.00	6.00	4.60
Antimony (Asiatic), N. Y.	14.75	14.50	17.00	13.50

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
May 25, 1937	2.605c. a Lb.	$23.25 a Gross Ton	$17.92 a Gross Ton
One week ago	2.605c.	23.25	17.92
One month ago	2.605c.	23.25	20.00
One year ago	2.097c.	18.84	13.08
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low	High	Low	High	Low
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	$21.92, Mar. 30	$17.92, Jan. 4
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

quiring 1000 tons of material. The same company will fabricate 3300 tons of plates and shapes for that part of the Sixth Avenue subway between West 9th and West 18th Streets, New York. The persistent demand for plates has precluded any material change in backlogs and promises continue to be extended.

Sheets

Sheet bookings show no particular change from a week ago. Deliveries on lighter gages of cold-rolled sheets are easier, owing to a falling off of automobile business. Backlogs on other grades of sheets, however, are practically unchanged and still of an extended period. As a result of this situation, many manufacturers are placing anticipatory orders in order to assure themselves deliveries when the material is needed late in the third and beginning of the fourth quarter. Sales for delivery in the fourth quarter are subject to prices prevailing at the time of shipment.

Tubular Products

Sales of tubular goods in the past week are below those of the previous period. Oil-country goods specifications and orders for standard pipe have eased off in the past 10 days. This trend has been expected in view of the heavy buying which had been going on for several months. The volume of incoming business, however, is still sufficient to keep producers from adding to their almost negligible stocks. Orders for miscellaneous line pipe sizes continue in good volume and deliveries are not much better than four to six weeks. Increased drilling programs this year, which are estimated by some quarters to be at least 15 per cent ahead of 1936, indicate a fairly steady volume of oil-country specifications throughout this year.

Strip

Fresh business, if anything, has been slightly better in the past week compared with the previous period, although the general trend is toward a leveling off process. The improvement noted last week is attributable to both automobile and miscellaneous purchases. Backlogs are slightly easier, with hot-rolled strip obtainable in three to four weeks and cold-rolled strip in about four to five weeks. A heavier buying movement is expected when automobile companies complete production plans for 1938 models.

Wire Products

Total wire business in the past week is slightly better than in the previous period, with the improvement dominated by manufacturers' wire specifications. Automobile makers and cold heading interests have been ordering freely. Buyers of wire products undoubtedly did not do as much forward buying as occurred in other finished steel markets. Wire nails have been moving rather briskly owing to building activity, and some large customers have found themselves with less stocks than was generally supposed. Other merchant wire business is comparatively light.

Tin Plate

Specifications at some plants are above theoretical capacity and mills are being pushed for more prompt shipments. Consumption continues at a high level and producers will have all they can do between now and the end of September to get out orders on the books.

Coal and Coke

A wage and working condition contract on behalf of union members in the "captive" mines of the H. C. Frick Coke Co. and its subsidiaries has been entered into by the company and the United Mine Workers. The wage agreement provides essentially the same wages and working conditions as the contract signed recently by commercial coal producers and was written only for members of the miners' union working mines in Mercer, Fayette and Washington counties. Contracts with independent companies are expected soon. Coke prices are firm, but the market is without unusual activity.

Japan's Armament Program Will Take 600,000 Tons of Iron

LONDON (*Special Correspondence*).—Armament and ammunition manufacture, including warship construction, will absorb 600,000 tons of iron in Japan this year. A further 400,000 tons, making 1,000,000 tons in all, had been allotted to the various government departments, but in view of the iron shortage it was agreed to reduce this latter amount by 35 per cent—about 140,000 tons. The amount estimated for armaments, however, has not been cut.

Japan's provincial governments and municipalities have been ordered to adopt similar economy measures as a result of the existing iron scarcity.

. . . 3500 tons of shapes taken by lumber company.

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. . . Structural awards total 5783 tons.

SAN FRANCISCO, May 24.—An award of 3500 tons of structural shapes made by the Puget Sound Pulp & Timber Co. at Seattle to Isaacson Iron Works headlined activity last week on the Pacific Coast. Material will be used in an extensive building program by the company. Bethlehem Steel Corp. took 1400 tons of shapes awarded by the Hollywood Turf Club. Aggregate structural awards were 5783 tons. Business in other forms of steel was light.

Bids will be opened June 3 by the City Clerk at Eureka, Cal., on approximately 60,000 lin. ft. of 24 and 30 in. lined and concrete coated steel pipe. This material is to be used in the Mad River Water Supply project. Los Angeles Metropolitan Water District has opened bids on 476 tons of cast iron water pipe.

The U. S. Army Board of Engineers has approved plans for the expenditure of approximately $34,000,000 for flood control work along the Los Angeles River. Bids are expected as soon as Congress makes the appropriation. Bids will be opened July 7 by the Navy Department for construction of reinforced concrete moorings at Pearl Harbor, T. H. Estimated cost is $275,000. At Helena, Mont., plans for the Tongue River dam are expected to be complete so that bids may be entered by June 28. Approximate cost will be $1,200,000.

Opening of the Golden Gate Bridge at San Francisco this weekend is attracting much interest. This $35,000,000 project contains approximately 100,000 tons of steel, which was supplied by McClintic-Marshall Corp., now the construction division of Bethlehem Steel Corp.

Republic Steel Corp., Cleveland, has appointed the following Enduro stainless steel distributers: Huey & Philp Hardware Co., 1900 Griffin Street, Dallas, and at 2310 Main Street, Houston, Tex., and Star Steel Supply Co., 7522 Oakland Street, Detroit.

. . . . CHICAGO . . . .

. . . Ingot output at 86 per cent plus as bessemer converters are put on.

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. . . New business continues at about last week's rate, deliveries better.

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. . . Only a slight decrease in general steel consumption seen for summer.

CHICAGO, May 25.—Ingot output is calculated at 86 per cent plus of capacity this week, for while three bessemer converters are being placed in operation at the Carnegie-Illinois Steel Corp. plant in Gary, thus increasing activity there 1.6 per cent, an open hearth was taken off for repairs in another district plant, making the net gain only fractional. The bessemers have not been operated since 1930.

New business continues to come in at about the same rate as last week, with shipments exceeding orders as a general rule. Deliveries, however, are improving only gradually, with sheets, strip and tin plate making the least progress.

May bookings appear to be slightly under those for April, and demand is mostly miscellaneous. Although practically no rails or track materials are being ordered, railroads are actively consuming bars, plates and shapes for car construction and repair. Sizable amounts of steel are also being taken for farm construction, bridge building, tanks, and the manufacture of cranes, road machinery and tractors. Automobile buying is reported to be tapering off somewhat, although there is still a good volume of business from that source. Only a slight decrease in general consumption is seen for the summer.

Structural jobs are dragging a bit, and fabricators are not fully occupied. A number of bridges are providing work, however, and a highway bridge building program is expected to bring in tonnage over the remainder of the year.

Tin plate deliveries are still bad, production and demand continuing at high levels. At Gary, the hot mills and cold reduction units will operate 15 turns this week, as opposed to 16, 17 and 18 turns in some weeks of the second quarter. The hot strip mill will operate 16 turns. It is understood that this reduction in activity is not due in any way to lessening of demand or to a reduction in business, but is merely a means of alleviating a temporary period of congestion in that department. The Gary sheet mill is to operate 18 turns, two more than normal, in all departments this week.

Pig Iron

Consumption of iron is steady, although May shipments are running slightly lower than those of April. This is because some first quarter shipments overlapped into April, making the total for that month higher than would ordinarily have been the case. Foundries, particularly those supplying castings for the automobile, farm implement and tractor plants, are working at capacity, and see a good summer ahead. Some spot sales are reported from sellers, but nothing on contract as the second quarter is well booked and third quarter books have not been opened. Stocks of charcoal iron are the lowest in many years.

Foundry Coke

Prices are firm and demand is good. No change in coke prices is anticipated the first of June. May shipments are down some from April, because of heavy buying in the first quarter for coverage against a possible price advance, which caused some deliveries to carry over into April.

Wire Products

As production continues at about 85 to 90 per cent of capacity, wire makers are able to improve their deliveries somewhat, and even up their stocks, although these cannot be built up to any extent as yet. Salesmen have not been particularly active of late, but it is believed that backlogs will be sufficiently reduced by the middle of June to send men out on the road again. Demand is good from industrial plants for wire rope. Electrical motor manufacturers are active consumers. Specifications and new orders are still coming in from automobile plants, but are not as heavy as formerly. Bale ties have not been sold in any quantity for some time, but the cutting of the first crops is expected to boost considerably the bookings of this product. Jobbers are entering their dull season. Delivery can now be made on rods in two to three weeks, while strip is booked practically solid throughout the third quarter. Nails are prompt.

Bars

Bar demand is equal to that for plates and shapes. Railroad buying is good, but sales to automobile plants have tapered off. Other active consumers are tractor and farm implement manufacturers, and makers of cranes and road machinery. Deliveries have improved further, but a continuous decrease in backlogs is not anticipated. At the moment, prospects for the summer appear to be good.

Sheets

Although one seller is able to deliver some grades in three to four weeks, as reported last week, another mill is still quoting from 20 to 24 weeks, so the situation is not improved generally. Shipment of coated sheets has recently been extended. Road building activity has boosted requirements for culvert sheets. A fair tonnage of sheets is being used by makers of washing machines and ironers, who are currently enjoying record production.

Rails

No new rail buying has been reported, but track laying is active, as is evidenced by the fact that railroads are pressing for shipments. The only inquiry to be announced here involves only 1100 tons and is for the Los Angeles Union Station.

Plates

Railroads and tank makers are about the only two consumers in the market here this week. Railroads are buying for construction and repair work under way in their own shops, while the tank people report the best business since boom times, and appear optimistic as to

summer prospects. New car buying is light and builders expect a car shortage to develop if car loadings continue at their present levels for long.

Structural Shapes

Not a great deal of activity has been reported this week, and few inquiries for pending projects are out. United Construction Co. was low bidder for the Cap au Gris dam across the Missouri River, which will require about 5500 tons of shapes. Bids will be taken May 27 on 125 tons of shapes for a warehouse at the Rockford, Ill., plant of the Ingersoll Milling Machine Co. A highway bridge in Indiana will require a 760-ton truss span, bids to be taken June 1, while another bridge, in Shiprock, N. M., for which bids have already been taken, will require 1000 tons of truss spans. In Dallas, a library for Southern Methodist University will take 500 tons of shapes.

Reinforcing Bars

This market is fairly active, although no awards were made this week. Inquiries and pending projects are promising, but consist mostly of comparatively small tonnages. A new store for Sears, Roebuck & Co. in South Chicago is expected to require a fair amount of bars, while in Springfield, on May 29, a bridge letting will also involve some reinforcing steel. Paving and bridge programs in Illinois and Indiana, which, though small, are continuous, are taking about 500 tons of bars weekly. About 500 tons will be up for bids June 3, for a $5,000,000 sewage treatment project at Stickney, Ill. Sellers are working on preliminary figures for a number of apartment buildings, which will eventually require some bar tonnages. The strike which began April 13 at the plant of the Calumet Steel Co. has been temporarily settled, and all employees have returned to work. Although the union was recognized, no formal contract was signed, company spokesmen stated. Prices generally are firm, and most sellers anticipate a busy summer, with a letdown in the fall.

Cast Iron Pipe

Demand for pipe is light, and inquiries do not indicate that any important tonnages will be forthcoming over the summer. The only job that has been reported will require about 140 tons of pipe and is for the city of Chicago. Prices are unchanged.

Inland Steel Refuses to Sign CIO Agreement; Strike Threatened

CHICAGO, May 25. — Inland Steel Co. today refused to sign a contract with CIO representatives, although in a statement of labor policy which was posted on plant bulletin boards and mailed to each employee the company agreed to recognize the SWOC as the collective bargaining agency for those of its employees who are members, and stated that there would be no discrimination shown toward any employee, whether or not a union member.

In a letter which accompanied the labor statement, J. H. Walsh, works manager at Indiana Harbor, said, "I am advised by the representatives of the committee (SWOC) that there are no material complaints as to wages, hours, or working conditions in our plant, and that the principal issue is the signing of their contract. This we have declined to do.

"We do not feel that it is for the best interest either of the company or its employees for us to sign a contract."

The conference was held in Mr. Walsh's office, five union representatives, including Van A. Bittner, regional director, SWOC, and Nicholas Fontecchio, Calumet chief, being present.

The unionists are said to have declared earlier that strikes were not wanted, but that an election supervised by the National Labor Relations Board would be desirable.

Inland employees will hold a mass meeting Wednesday night to decide on strike, which union says is inevitable. Harry E. Roulfs, Inland industrial relations superintendent, says plant will be closed if strike is called.

The CIO secured a collective bargaining agreement yesterday with American Steel Foundries, employing 7000 men, 2000 of whom work at the company's Hammond, Ind., plant, in the Chicago district.

. . . Awards of 2235 tons —10,835 tons in new projects.

AWARDS

Livingston County, N. Y., 150 tons, highway project, to Wickwire Spencer Co.

New York, 100 tons, George Washington bridge ventilating building, approach, to Bethlehem Steel Corp.

New York, 150 tons, highway project in Bronx, to Fireproof Products Co.

Baltimore, 700 tons, Howard Street bridge, to Truscon Steel Co.

Richmond, Va., 200 tons, high school, to Virginia Bridge Co.

Cleveland, 300 tons, warehouses for George Worthington Co., to Concrete Steel Co.

Cleveland, 100 tons, hockey rink, to Patterson-Leitch Co.

Wayne County, Ill., 250 tons, incinerators, to Joseph T. Ryerson & Son, Inc.

Crockett, Cal., 130 tons, John Swett high school, to Bethlehem Steel Corp.

Knob, Cal., 154 tons, All-American Canal project, to Bethlehem Steel Corp.

NEW REINFORCING BAR PROJECTS

New York, 1175 tons, New Jersey approach Lincoln tunnel, Port of New York Authority; bids June 13.

New York, 210 tons, East River Drive, Grand to East 12th Streets; bids June 3.

Hoboken, N. J., 380 tons, Publication Corp. buildings.

Ulster County, N. Y., 250 tons, exploratory caissons, Lackawack dam, Board of Water Supply; bids June 2.

New York, 1320 tons, Bronx-Whitestone bridge, Port of New York Authority.

New York, 175 tons, bulkhead wall and sewer connection.

Buffalo, 200 tons, Ontario Street grade crossing for New York Central Railroad; bids May 27.

Dearborn, Mich., 700 tons, Veterans' hospital.

Detroit, 1000 tons, Brewster housing project.

Detroit, 500 tons, J. L. Hudson Co. warehouse.

Chicago, 1100 tons, Southwest sewage treatment works.

Folk Siding, Idaho, 750 tons, Bureau of Reclamation, Invitation 21041.

St. Paul, 500 tons, Montgomery Ward building.

St. Paul, 150 tons, Egan-Chevrolet building.

Stickney, Ill., 500 tons, sewage disposal plant; bids June 3.

State of Illinois, tonnage unstated, State bridge projects; bids May 29.

Cap au Gris, Mo., 640 tons, dam No. 25 in Mississippi River; United Construction Co., Winona, Minn., low bidder on general contract.

St. Louis, 750 tons, superstructure for municipal armory; bids May 25.

Emeryville, Cal., 160 tons, Paraffin Co. plant; Clinton Construction Co., low bidder on general contract.

Fort Baker, Cal., 350 tons, general construction work; bids opened.

Potholes, Cal., 395 tons, All-American Canal; bids opened.

Potholes, Cal., 270 tons, two invitations for Gila project; bids opened.

. . PHILADELPHIA . .

. . . Colonial Iron Co. blows in Riddlesburg stack.

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. . . New flat rolled business equals 70 per cent of shipments.

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. . . Reading Co. plate awards expected this week.

PHILADELPHIA, May 25.—Fresh interest in new steel commitments is currently at low ebb, not for the reason that additional supplies are not wanted but rather as a reflection of the attendance of many purchasing agents at the Informashow at Atlantic City and at a convention at Pittsburgh. On the other hand, steel sellers will have their routine interrupted by the American Iron and Steel Institute convention this week in New York.

Considering the problem most generally, there is no doubt but that shipments at the moment are outrunning the inflow of new orders in this area. Mill backlogs are being altered only very slowly if at all, and delivery promises are still almost as unsatisfactory (for the consumer) as they have been over the past several months. The delivery situation is additionally complicated by the fact that on occasion some cancellations and postponements have come through which have left open spaces in rolling schedules, thereby enabling new purchasers to slip in orders for quick shipment. Such action, however, is infrequent, but on occasion it has served to give a false opinion as to what mills can regularly do in the way of shipments.

Wire and sheet mill products continue to be most in demand here. Certain grades of bars are available on short notice, the demand for shapes is not very impressive, and plate inquiry is not very brisk at the moment even though all district mills are far behind in deliveries on old orders.

There has been little change in open hearth activity in eastern Pennsylvania, and the rate for the current week is maintained at 71 per cent. Alan Wood intends to add another furnace the first of the month, and reports from other mills indicate that the district's rate may show a small increase over the next fortnight.

Pig Iron

With third quarter order books still publicly closed, fresh inquiry has naturally tapered. Nonetheless, the situation in pig iron is healthy. Most foundry stocks have been liquidated, and buyers in general are entering releases at a faster pace than their second quarter contracts call for. Foundry melt in this immediate area has suffered no setback, and in some instances slightly better operations are reported. With consumption thus maintained at a high level, all sellers anticipate a splurge of orders within the next week or so when third quarter positions become available. All talk favoring higher prices has died out, and sellers here look for reaffirmation of current quotations when their new price instructions come through. The Riddlesburg stack of the Colonial Iron Co. was blown in last Thursday after a eight-year period of idleness, and is now turning out foundry and basic iron at the rate of 200 tons daily. This furnace is starting out with a sizable backlog of foreign business, which will be shipped during the summer. Several boats are expected in shortly to pick up export iron from other furnaces on orders placed several months ago. Current foreign inquiry before the trade is neither of great volume nor very firm, and, as far as can be determined, no new commitments have been taken by any furnace.

Warehouse Business

The volume of orders so far in May almost equals that placed in April, and most warehouses and jobbers fully anticipate a heavy turnover through the summer months. In line with the stability of mill prices for third quarter, secondary sellers look for no changes in their quotations. Stocks are generally in good shape and plenty of orders have been placed on mill books to take care of estimated forward requirements. Galvanized sheets currently are in best demand, stainless steel is moving at a rapid pace, and soft steel bars and plates and alloy steel bars are all conspicuous items in order books.

Sheets and Strip

New orders in this territory are probably in the neighborhood of 70 per cent of current shipments. Mills, however, are seemingly unable to make any serious inroads in their backlogs, the result being that delivery dates today are just about as far forward as they were a week ago. Cold reduced sheets are probably the easiest flat rolled item, with delivery possible in three to four weeks, but promises on other products range all the way up to 24 weeks in some instances. However, some mills are much heavier loaded than others, the result being that buyers can often shop around and find soft spots on rolling schedules and thereby obtain comparatively quick delivery on certain items which in general is not typical of the market. All substantial buyers of tin plate are covered for the remainder of the year, and most mills refuse to consider the occasional floating tonnages which come in from jobbers or indifferent users. The tin plate export market still is very active, but little or no business has actually been placed even with price premiums available. Consumption of sheets in local autobody stamping plants has declined considerably as attention is now concentrated on getting dies for new models in shape. In about a month new sheet specifications for these 1938 models will start coming through. The Budd company expects to purchase about 100 tons of 18 and 8 stainless steel strip for a new train within the next week, and probably will soon place heavy orders of frame stock within the fortnight.

Plates and Shapes

The disposition of the underframes for 700 Reading Co. cars is awaiting the tabulation of competitive bids, probably on Thursday of this week. Consequently, the allocation of the 3000 to 4000 tons of plates involved will not be announced until that time. Bethlehem Steel Co. has secured three passenger-cargo boats for the Panama Railroad Steamship Co., and the rolling of the 15,000 tons of hull plates required will be spread over

the next several years. Bids on two Sinclair tankers will be taken on June 10, and the Government has two battleships and two submarines up for bidding on June 27. With a lull in new orders, there has been a tendency for plate backlogs in this area to decline slowly, although the easiness has not been pronounced and deliveries under 10 weeks are very difficult to obtain. The market for shapes continues to be very listless. The week's awards include 375 tons for a Reading, Pa., industrial building, to Belmont Iron Works, and a Chadds Ford, Pa., highway bridge, involving 485 tons of shapes, awarded to Bethlehem Steel Corp. Several sizable jobs are scheduled for bidding over the next week, but no new business of any moment has come up for estimating. The Howard Street, Baltimore, bridge, calling for 3600 tons has not yet been definitely placed with a contractor. Reinforcing steel is lifeless, with little in promise for the future.

Imports

The following iron and steel imports were received here during the past week: 10 tons of ferrochrome from Japan; 201 tons of sponge iron, 70 tons of steel forgings, 46 tons of steel tubes, 91 tons of steel billets, 94 tons of wire rods, and 61 tons of steel bars from Sweden; 5 tons of steel bars and 187 tons of structural shapes from Belgium.

Buzzards Bay Water District, Buzzards Bay, Mass., plans about eight miles of 6, 8 and 10-in. for extensions in water system; also 200,000-gal. elevated steel tank, pumping machinery and other waterworks installation. Cost close to $150,000. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Franklin, Tenn., plans about two miles of 8-in. and one mile of 6-in. for extensions in water system. New pumping equipment will be installed for booster service at waterworks station. Cost about $30,000. Marr & Holman, Stahlman Building, Nashville, Tenn., are consulting engineers.

Dresser Junction, Wis., will take bids soon for pipe lines for water system and other waterworks installation, including pumping plant. Fund of about $25,500 is being arranged through Federal aid. Banister Engineering Co., 556 North Prior Avenue, St. Paul, Minn., is consulting engineer.

Richland Center, Wis., plans about 2500 ft. of 30-in. for main underground pipe line for water supply from dam to power station. Commercial Testing & Engineering Co., 360 North Michigan Avenue, Chicago, is consulting engineer.

Colorado Springs Park Commission, Colorado Springs, Colo., plans about 8000 ft., various sizes, for extensions in water system in park and picnic ground districts.

Grass Lake, Mich., plans pipe lines for extensions in water system and other waterworks installation. Cost about $55,000. Financing will be arranged soon.

Allerton, Iowa, has voted bond issue of $24,000 for water system and other waterworks installation.

Purchasing Office, Department of Interior, Washington, asks bids until June 16 for 6700 ft. of 4 to 10-in. for new water system at Cherokee Agency, Cherokee, N. C., wih screening house and other installation (Proposal 2593).

Eden, Tex., plans about 16,000 ft. of various sizes for water system; also pumping station and storage facilities. Cost about $36,000.

Los Angeles Metropolitan Water District will open bids June 3 on 262 tons of various sizes.

Sweet Home, Ore., plans pipe lines for water system and other waterworks installation. Cost over $70,000, of which about $50,000 will be secured through bond issue.

...Steel demand only slightly less than mill capacity.

CINCINNATI, May 25.—Demand for finished steel is well sustained at slightly less than mill capacity. Consumers are moving to protect themselves through third quarter. Production is at capacity since second quarter backlogs are still heavy, except on cold rolled items. Deliveries on these latter sheets are about 30 days according to the leading district interest, but hot rolled annealed and galvanized sheets are extended to 60 days or slightly beyond. Automobile demand is easing as some manufacturers prepare for die tryouts and changeover to new model production. Despite this, mill interests report automobile demand to be well above that of a year ago, with less of a decline likely during the summer months.

Open hearth operations are about 90 per cent. Thirty out of 34 furnaces are now in operation.

The pig iron market is without interesting feature. Ordering is still restricted to needs since furnaces offer no inducement to anticipate future requirements. The melt is heavy as foundry operations at almost capacity rate are reported.

Laughner Oil & Gas Co., South Heights (Beaver County), Pa., plans welded steel pipe lines for natural gas transmission in several townships in Beaver and Allegheny Counties, including Harmony, Sewickley, Franklin and Marshall Townships; distributing lines will be installed in different communities. Cost over $100,000.

Moore & Wright, 304 East Main Street, Bradford, Pa., T. C. Moore, engineer, head, plans welded steel pipe line and steel pipe line gathering system in connection with development of oil properties in Poland Hill district, Poland Township, Chautauqua County, N. Y. Main pumping station will be installed for booster service.

Pure Oil Transportation Co., Bay City, Mich., has work under way on new steel pipe line gathering system in Buckeye oil field, Gladwin County, Mich. Cost close to $150,000 with pumping stations for booster service for oil transmission.

Hidalgo Gas Co., McAllen, Tex., plans welded steel pipe line from point near McAllen to Donna, Mercedes and neighboring communities in Hidalgo County, Tex., for natural gas transmission. Company has secured a 50-year franchise for natural gas supply in different parts of county.

Texas Co., Houston, Tex., has authorized new 6-in. welded steel pipe line from Ganado, Tex., oil field (Jackson County) to point near Mauritz, Tex., about five miles, for crude oil transmission. Connection will be made at last noted point with main pipe line of Shell Petroleum Corp., St. Louis.

Michigan Gas Transmission Corp., United Artists' Building, Detroit, has authorized extensions in welded steel pipe line system in Hamilton County, Ind., to Cicero, Tipton, Atlanta and Westfield, Ind., for natural gas supply for these communities; also for new welded steel pipe lines to Crawfordsville, Roachdale and other points in north central Indiana, where natural gas service will be furnished. Connection will be made with main trunk line of company extending through Hamilton County to Detroit. Local distribution at different communities will be carried out by Northern Indiana Power Co. and Public Service Co. of Indiana, both Traction Terminal Building, Indianapolis, which will install control stations and other operating facilities. Entire project will cost over $1,000,000.

Division of Purchase, Sales and Traffic, Department of Agriculture, Washington, closes bids May 28 for steel pipe and couplings for use at Statesville, N. C. (Proposal 10332).

Southern California Gas Co., Los Angeles, has awarded general contract for 13 miles of 22-in. welded steel pipe to Bechtel & Kaiser Co.

Eureka, Cal., will open bids June 3 on 54,200 ft. of 24-in. pipe and 8800 ft. of 30-in. for Mad River water supply project.

Mountain Fuel & Supply Co., Salt Lake City, Utah, has awarded general contract for 21 miles of 10-in. pipe to Bechtel & Kaiser Co.

Public Utilities Commission, City Hall, San Francisco, asks bids until June 7 for steel pipe in connection with control works for Sunset reservoir, for which bids will be received at same time, including 1050 ft. of 54-in., and 900 ft. of 60-in., both $\frac{3}{8}$-in. plate; and 17,700 lb. steel pipe specials (Specifications WD-120). N. A. Eckart is general manager and chief engineer.

. . . CLEVELAND . . .

. . . Mill backlogs being reduced and less pressure exists for deliveries.

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. . . Operations drop three points at Youngstown and seven points in Cleveland-Lorain.

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. . . Slowing down in automotive parts plants occurs as runs on 1937 models near end.

CLEVELAND, May 25.—With reduction in mill backlogs, less pressure for deliveries of finished steel and a moderate slowing down in new business, ingot output dropped this week seven points to 80 per cent of capacity in the Cleveland-Lorain district and three points to 84 per cent of capacity in the Youngstown district.

Mills have orders for about all the tonnage in all finished steel products they can produce during the second quarter and some are comfortably filled for the third quarter. However, many consumers are no longer crowding mills for early shipments and, with this change in the situation, many producers are able to work in new orders, if large tonnages are not involved, for rather prompt rolling in case customers are in a hurry for their steel. Delivery in three to four weeks has been promised on some plate business, although mills have from three to five months backlogs. Delivery in three weeks was promised on an order for tin plate placed during the week. Several grades of sheets are available for shipment in about three weeks, which is the normal period required for processing. Most of the new demand for finished steel at present is for material for early requirements rather than for extended deliveries, and the mills that can make the earliest shipments are naturally being favored with this business.

While the decreased volume of steel business indicates the usual seasonal decline, few consuming industries have as yet curtailed operations, the only marked slowing down being in some of the automotive parts plants, and this is due to the approaching completion of production schedules on 1937 models. However, steel orders from automobile manufacturers for production of new models are increasing and a large purchase by the Ford Motor Co. is expected shortly.

Activity in the building field has slackened, this being particularly true of private work. This falling off is attributed partly to the unsettled labor situation, which makes construction costs uncertain. Railroad demand continues light.

With no consumer demand to support the market, scrap prices have taken another 50c. drop. An early buying movement is not looked for as mills in this district have enough scrap in their yards and under contract to last them six to eight weeks with present operations.

Pig Iron

Shipments are heavy and continue to run ahead of deliveries in April, but not much new business is being placed. Third quarter prices will be announced about June 1. It is expected that present prices will be reaffirmed; hence there will be no price stimulus for an early buying movement. Consumer operations are actively sustained, but no need seems to exist for additional purchases of iron in substantial quantity for the current quarter.

Sheets

A further easing up in the delivery situation is in evidence. While new demand is fair, shipments are heavier than incoming orders and backlogs have been further reduced. Normal deliveries, or in about three weeks, are being promised on cold rolled, heavy gage hot rolled and enameling sheets. Light gage hot rolled sheets are available for July shipment. Most mills are filled up with orders for hot rolled annealed and galvanized sheets until August. Some consumers still have good stocks and in some cases tonnages reserved by mills for regular customers have not all been taken out. Considerable new business is now coming from the automobile manufacturers for 1938 models. The Ford Motor Co. plans to place orders next week for sheets for 50,000 present models to wind up production of 1937 models and in June will buy sheets for a production schedule of 250,000 new model cars.

Strip Steel

Motor car parts plants are specifying freely, but still have considerable tonnage under contract and are not placing new orders. Miscellaneous demand is rather quiet. Deliveries continue to improve, some mills being able to ship hot rolled strip in about three weeks. Backlogs are heavier on cold rolled strip, most of the mills having orders for all the tonnage they can get out in June.

Bars, Plates and Shapes

Miscellaneous orders for bars are holding to recent volume and deliveries continue to grow easier, several mills being able to take orders for late June shipment. Operations of some of the forge shops making automobile parts have slowed down, now that motor car manufacturers are winding up production of their 1937 models. Demand is good from agricultural implement, power shovel and crane manufacturers, industries that are maintaining high production schedules. Structural shapes and plates continue fairly active. New inquiry in the construction field is light and little work is pending. No bids were received for the Lorain Avenue grade crossing elimination project, Cleveland, requiring 500 tons, contractors claiming that they could not hold bids within the cost estimate of the Ohio Highway Department. Concrete Steel Co. has been awarded 300 tons of reinforcing bars for warehouses for the George Worthington Co., Cleveland.

Iron Ore

Ore shipments during May are expected to amount to more than 9,000,000 tons and to break previous records for the month except in 1929 when over 9,500,000 tons was moved by water. The entire Lake fleet of 308 boats was in commission May 15. With the 4,737,657 ton reduction in ore

stocks during the year ended May 1, 1937, the amount in furnace yards and on docks on the latter date, 14,632,033 tons, broke below the low point of 1929 when stocks on May 1 were down to 15,929,901 tons. The average amount of ore in furnace yards and on docks on May 1 for a number of years has been about 20,000,000 tons.

Steel Research Work Intensified

RESEARCH activities of steel companies in 1937 are broader and more intensive than in any recent year, according to reports made to the American Iron and Steel Institute by companies representing nearly 90 per cent of the capacity of the industry.

More than $10,300,000 will be spent in research work this year, it is indicated, a figure 12 per cent above the total of $9,200,000 spent for research in 1936 and nearly 20 per cent above the 1929 research budget of $8,700,000.

In preparation for the expanded research program of this year, additional research facilities and equipment valued at nearly $2,000,000 were put into use during 1936, increasing the total investment in equipment for steel research to nearly $8,000,000.

More than 2350 engineers, metallurgists, chemists, physicists and other technical experts are now employed in the research laboratories of the steel industry. In addition, almost 1200 other employees of the industry devote part of their time to research work.

The reports also disclose that a larger share of the steel industry's dollar spent for research in 1937 is devoted to study of possible new markets and uses for its products than in last year.

Twenty-eight cents out of each dollar spent for research this year goes into the study of possible new uses for standard products and into investigations to determine applications where new products can be used to advantage, compared with 22c. in 1936.

Investigations along the line of developing new products has consumed 20c. out of each dollar spent for research both this year and last.

Approximately $3,400,000 of the research expenditures of the industry will go to discovering means of improving the quality of its various products, substantially the same amounts spent for this purpose in 1936, but only 33 per cent of the 1937 research expenditures as against 40 per cent last year.

About 19 per cent of the 1937 research budget, against 18 per cent in 1936, goes into efforts to improve manufacturing methods and thus pave the way for lower prices to steel consumers.

Follansbee Program To Cost $4,000,000

IN the modified modernization program proposed under the company's plan of reorganization, Follansbee Brothers Co. plans to change the size of its proposed hot strip mill from 48 in. to 43 in. and to install equipment to enable the hot mill to produce cold rolled strip. The company also plans to eliminate one single stand four high cold reducing mill and its supplementary equipment which was previously contemplated.

The modernization plan proposes the dismantling of the present forging press, bar mill, and hot sheet mills at the Toronto, Ohio, plant. These would be replaced with a 43-in. combination slabbing and hot strip mill capable of finishing about 264,000 net tons when rolled from slab ingots and light slabs.

The new mill is to be supplemented by equipment for heating the slab ingots preparatory to slabbing and for reheating the slabs for strip rolling. The plan provides for space for additional future soaking pit facilities.

The plates for tinning will be rolled from hot rolled strip. A strip pickler, one single stand four high cold reducing and skin pass mill, are to be provided for the manufacture of strip black plate for tinning. Annealing facilities are available in the present locations. A Mesta pickler now on hand is to be later installed for white pickling.

Not less than $4,890,000 of new money, after deducting underwriting commissions, will be raised by the sale of new securities, and approximately $4,000,000 of this sum will be used to pay the cost of the modernization program. The remainder will be used to pay expenses of reorganization, allowances for compensation in the reorganization proceeding, and obligations of the trustees and of the company to be assumed and paid by the reorganized company, and to provide additional working capital. The new securities to be sold will be 70,000 shares of new common stock and $4,000,000 of new bonds, which will be sold so as to net the reorganized company not less than $1,050,000 and $3,840,000 respectively after deducting underwriting commissions. The new bonds will be secured by a closed first mortgage.

RAILROAD BUYING

Aliquippa & Southern is inquiring for 20 100-ton rack cars.

National Tube Co. has ordered 103 bodies for 70-ton gondola cars from Ralston Steel Car Co.

Reading Co. is inquiring for 650 underframes for freight cars to be built in its shop.

American Railroad of Porto Rico is inquiring for 40 5000-gal. tank cars.

Litchfield & Madison is inquiring for one 0-8-0 and one 2-8-2 type locomotives.

Fort Worth & Denver City has ordered four passenger cars from Edward G. Budd Mfg. Co.

Norfolk Southern is inquiring for one motor office rail car.

Union Pacific's expenditure of approximately $14,000,000 will be spent for 4088 freight cars, instead of 3800, as announced last week in THE IRON AGE. All cars, except ballast and tank cars, will be of wood-lined, light weight steel construction. This design is expected to result in a 14 to 20 per cent reduction in weight of the cars.

Timken Roller Bearing Co., Canton, Ohio, has received an order from Baldwin Locomotive Works for bearings to equip all driving axles and engine trucks on 30 4-8-4 type steam locomotives being built for the Milwaukee Road. Rock Island Lines are remodeling 10 4-8-4 type steam locomotives and one 2-10-4 type unit to include Timken tapered roller bearings on all driving axles. All driving axles, engine and trailer trucks on five 4-6-4 type steam locomotives now being built for Lackawanna Railroad will be equipped with Timken roller bearings. All axles, including driving axles on 17 4-6-6-4 type steam locomotives and tenders under construction for Northern Pacific and six units of the same type for Spokane, Portland & Seattle Railroad will likewise be equipped with Timken bearings. Baldwin Locomotive Works is building eight 4-8-4 type locomotives and tenders for the Northern Pacific and three more for S. P. & S. RR. which will be equipped with Timken bearings.

RAILS AND TRACK SUPPLIES

Western Maryland has ordered 2060 tons of rails.

Columbus & Greenville has ordered 1257 tons of rails.

Railroad Buying Gains Steadily

RAILROADS spent $253,117,000 on equipment and materials during the first quarter of 1937, according to *Railway Age*. Purchases in the first quarter of 1936 totaled $125,725,000 against $85,657,000 for the same period in 1935.

The value of material received from suppliers amounted to $81,050,000 for the first quarter of 1935, $111,865,000 for the first quarter of 1936, and $171,375,000 for the first period of 1937, indicating a gain for 1937 over 1935 of 111 per cent.

While purchases for the first quarter of this year were less than in 1929 and 1930, they exceeded those made in 1931 by almost 70 per cent.

. . . . NEW YORK. . . .

. . . Steel buying in fair volume, though below average of early months this year.

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. . . Leading consuming lines, except automobile, using steel in unreduced amount.

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. . . Tin plate demand expected to remain strong to end of year.

NEW YORK, May 25.—A fair volume of business is being done by New York sales offices of leading steel companies. Some companies report that the volume is better than had been expected, though it does not compare with the high totals of early months of the year.

A survey of conditions prevailing in principal steel consuming lines reveals that, aside from the automobile industry, there is no decline in consumption of steel at present or in immediate prospect.

Tin plate is still the brightest spot in the steel situation in the matter of continued volume demand. It is now believed that the tin plate mills will be able to operate at virtually 100 per cent of capacity to the end of the year.

Railroads are almost second to the can companies in the continuity of their demands. While there is very little new business in track work, and none of importance expected within the near future, the outlook for equipment appears to be exceptionally good, especially in view of the sustained volume of freight traffic. There may be some hesitancy about further large purchases of cars and locomotives until the Interstate Commerce Commission has decided upon pending freight rates advances, but once this issue is out of the way—and the outcome is expected to be favorable for the railroads—a new wave of equipment buying is looked for. In all probability this will be one of the strong spots of the autumn demand for steel.

Pig Iron

Dullness still features the New York pig iron market on the eve of third quarter price announcements, which are expected to record no changes. Because of this feeling, there has been no speculative buying, although two New England foundries bought iron last week for delivery before July 1, allegedly because they had underestimated their requirements earlier. Most foundries are well stocked. In fact, production in the jobbing trade is falling off, but shipments from the furnaces are being maintained, indicating a rise in foundry stocks. There is little activity in spot iron, and no large purchases are looked for when third quarter books are opened around June 1. Foreign inquiry is sustained, though in relatively small lots. An inquiry from a reliable source asks for available tonnages for an indefinite period; another, asks for year's contract bid for 250 tons a month.

Plates and Shapes

Plate orders still continue in good volume, and some local offices are still not actively soliciting new business because of large mill backlogs. There is little change in the delivery situation. Sheet shipments are improved and in enameling grades are being quoted as low as four weeks, with the average for all grades around 15 weeks. While a miscellaneous volume of orders is being sustained, the pressure for delivery on the part of buyers has eased as they come to realize the true situation at the mills.

Wire

Delivery is still long on the heavier gages, but open spaces are now available on mill schedules for lighter material and business for these grades is being actively solicited. New orders are off from peak levels of March, but the volume is now stabilized at the lower level.

. . BIRMINGHAM . .

. . . Backlogs sufficient to maintain steady operations.

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. . . Current bookings are light.

BIRMINGHAM, May 25.—Production and shipments continue steady, with backlogs adequately providing for full time operations. Current bookings are rather light. During each of the past two weeks new tonnage was about the same.

For several days last week all nine of the Fairfield open hearths were active, and the district's total was 19. During the remainder of the week there were 18, with eight at Fairfield, five at Ensley and five at Gadsden. This week 18 are again scheduled. The blast furnace total remains at 16.

Both the steel and iron markets are considered stable, with a fair run of new tonnage. Pig iron buying at this time is mostly spot. Unfilled contract tonnage, both steel and iron, is still large.

Last week a strike occurred at the Fairfield plant of the Barrett Co. More than 100 employees walked out over contract demands. The Union Foundry, at Anniston, was also closed last week by a strike.

In an address before the Birmingham Kiwanis Club last week, John L. Perry, president of the Tennessee Coal, Iron and Railroad Co., stated that his company's tonnage during the first four months of 1937 was 30 per cent greater than for the same period in 1936 and that it was now employing 23,000 men, a larger number than in 1929 and within 600 of the all-time high.

. . . *Good third quarter in pig iron expected.*

BOSTON, May 25.—Pig iron sales are very small, and shipments on old contracts have slowed up somewhat, but there continues every indication that third quarter business will be good. By-product foundry coke makers report shipments holding up well, but not increasing.

A number of small and medium sized bridges for Massachusetts, New Hampshire and Maine for figuring has given the steel fabricators a new lease on life. Production of cast iron pipe is holding to its recent high level. Electrical appliance manufacturers report increased bookings. Connecticut hardware manufacturers as a rule are busy, but not quite as much so as a month or two ago. The Worcester Wire Works, Worcester, Mass., has let a contract for a plant addition and alterations. Gradually New England industries one by one are becoming unionized.

. . . *British mills still unable to supply all consumers' needs.*

LONDON, May 25 (By Cable).—The home demand is increasing but it is impossible to supply all consumers' needs. Unsold pig iron stocks are virtually nil. Cleveland forward sales have ceased. New home prices are not yet fixed. The hematite shortage is less pronounced, but current output is all absorbed.

Ore imports are increasing and are being accumulated to permit the restarting in the near future of additional blast furnaces. There is a strong demand for coke. Steel makers are heavily sold, and are able to book only a small proportion of new business. Rerollers are still needing semi-finished supplies.

The tin plate market is quiet, and prices are steady. Makers are anxious over the coal and steel situations. Black galvanized sheet demand is good, but makers are wanting sheet bars.

The steel demand on the Continent is unsatisfied and semi-finished sales are suspended except to United Kingdom, Norway and Finland, with which permanent contracts exist. Wire rod sellers are off the market. The Wire Rod cartel is yet undecided as to its future policy owing to the fact that the French members are unable to agree among themselves on quotas.

Steel bar premiums are obtainable from 45s. to 70s. with delivery delays up to six months. New prices in uncontrolled markets are yet unfixed. Hoops are active. Hot rolled makers are sold until July. Plate sheet demand is good. British prices are unchanged. The Continental official gold price on billets is £4, 7s. 6d.; wire rods, £5, 2s. 6d.; sheet bars, £4, 8s. 6d.

. . . *Spot buying now rules in iron and steel.*

TORONTO, May 25.—Canadian iron and steel producers now are depending on spot sales. No large tonnage contracts for forward delivery have been reported. Spot buying, however, is in sufficient volume to enable producers to maintain high operating schedules and backlogs are at the best level in years. Prices remain unchanged and local representatives of steel companies do not look for early revision in lists. Export demand for steel is holding at a steady level and Eastern Canada mills report good contracts from Britain and the British dominions.

Merchant pig iron sales are sustained in lots ranging from a car to 300 tons, but no future delivery orders have been placed. Melters covered by contract are taking scheduled delivery, and those who have adhered to hand-to-mouth buying are entering the market at regular intervals. Scarcity of iron scrap continues to stimulate pig iron sales. Prices are firm.

Minor reductions in scrap prices have been posted by Canadian dealers following a decline in prices in the United States. Scrap offerings have been comparatively small. Iron grades are scarce and very little cast or stove plate has been thrown on the market, while malleable is held in small quantity by only a few dealers.

. . . *Steel buying lighter, deliveries better.*

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. . . *Mississippi River dam to take large tonnage.*

ST. LOUIS, May 25.—United Construction Co., Winona, Minn., is the low bidder on the general contract for dam No. 25 in the Mississippi River at Cap Au Gris, Mo., requiring 4000 tons of structural, 640 tons of reinforcing bars, 219,430 sq.ft. of steel sheet piling, 1518 track ft. 80-lb. rail and 392 track ft. 60.5 lb. rail and fastenings, and 310 tons of steel castings. Reinforcing bars totaling 750 tons will be required for the superstructure for a municipal armory here.

Buying of finished steel is light, and inquiries are few. The sheet delivery situation is a bit better, but plates and bars are still being sold only for August and September delivery. Galvanized sheets are about eight weeks behind with a leading mill.

Implement manufacturers in the St. Louis area are making plans to continue operations at a peak rate this summer, ceasing only for a two-week period for inventory and vacations. Operations are on a five-day week schedule. The five-day week also has been put into effect in the Belleville stove district, the demands of the molders being put into effect earlier than the usual June 1 slowing down. But the stove manufacturers are getting ready for a big demand for their product. Foundries catering to the electrical trade have shown a marked pick-up in operations as a result of the settlement of several strikes in the electrical industry.

Shipments of pig iron are holding up well, although orders are slowing down. It is expected that prices will be unchanged when books for third order business open May 31. Ingot operations in the St. Louis area continue at 90 per cent of capacity.

The Navy Department has postponed from June 16 to June 17, the date for opening bids for the construction of two submarines. On the same day bids will be opened for the construction of a battleship.

. . .NON-FERROUS. . .

. . . Copper sells abroad as price rises to 14.75c.

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. . . Lead and spelter prices steady; buying is moderate.

NEW YORK, May 25.—While domestic buyers maintained their cautious attitude, the foreign copper market yesterday and today was enlivened by a surge of buying which in turn precipitated a sharp price advance to a basis ranging between 14.55c. and 14.75c. a lb., c.i.f. usual Continental base ports. This premium over domestic metal has naturally resulted in some sizable sales by leading exporters here, but market sentiment has it that this activity will taper within the near future inasmuch as much of the buying reflects efforts to cover on short contracts. So far, consumers of red metal here remain unconvinced that now is the time to place heavy forward orders, the result being that the current 14c. a lb. figure for the electrolytic grade has no great amount of underlying strength. There is quite a bit of 14c. metal available for delivery up through September, but spot positions are far from easy to obtain. Sales so far this month total only 32,000 tons.

The combined deliveries of brass and bronze ingots and billets by members of the Non-Ferrous Ingot Metal Institute for April amounted to 10,101 tons. For the 28-day period ended May 14, the average price for 80-10-10 brass was 16.603c. and for commercial 85 per cent metal the average was 14.562c. per lb.

Zinc

Buyers are ignoring a rising price in the London market, and, for the most part, seemingly are convinced that they have nothing to lose by delaying on their coverage of fall requirements. Reflecting this attitude, sales last week amounted to only 3100 tons, of which 900 tons was sold on an average price basis and the remainder at 6.75c. a lb. A little shopping around is necessary to obtain June metal, but there is plenty being offered for August and September shipment at 6.75c., East St. Louis. Forward contracts were reduced 1800 tons during the week, and undelivered metal now stands at 66,700 tons. June production will probably show a sizable increase.

Lead

A satisfactory volume of new business continues to come in each day, this condition being borne out by a steady price level of 6c. a lb., New York. Consumption of lead continues to approximate 50,000 tons monthly, and about 50 per cent of the June requirements is yet to be purchased. April statistics were in line with those of preceding months in that some stocks had to be liquidated to take care of demand. Production for the month totaled 46,500 tons whereas shipments equaled 55,200 tons, thereby resulting in a stock reduction of 8700 tons.

Tin

As in other metals, domestic tin consumers show complete disinterest in a strengthening position abroad. Buying during the week has been nil. Nonetheless, the price for Straits metal has moved up gradually, in sympathy with London, to today's level of 56.75c. a lb. The one strong point in the market is that tin mills here have no large stocks at hand despite their high operating rate. The third quarter, particularly, is almost completely uncovered as most mills are still of the opinion that they may be able to pick up their requirements at around 50c. a lb. some time during the summer.

The Week's Prices. Cents Per Pound for Early Delivery

	May 19	May 20	May 21	May 22	May 24	May 25
Electrolytic copper, Conn.*	14.00	14.00	14.00	14.00	14.00	14.00
Lake copper, N. Y.	14.12½	14.12½	14.12½	14.12½	14.12½	14.12½
Straits tin, spot, New York	56.25	56.37½	56.50	....	56.75	56.75
Zinc, East St. Louis	6.75	6.75	6.75	6.75	6.75	6.75
Zinc, New York	7.10	7.10	7.10	7.10	7.10	7.10
Lead, St. Louis	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York	6.00	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Noon Price.
Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.75c. a lb., prompt, f.o.b., New York.
Quicksilver, $96.00 to $98.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 14.50c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	56.00c. to 57.00c.
Tin, bar	59.25c. to 60.25c.
Copper, Lake	15.00c. to 16.00c.
Copper, electrolytic	15.00c. to 16.00c.
Copper, castings	14.75c. to 15.75c.
*Copper sheets, hot-rolled	21.62½c.
*High brass sheets	19.50c.
*Seamless brass tubes	22.25c.
*Seamless copper tubes	22.37½c.
*Brass rods	16.00c.
Zinc, slabs	8.00c. to 9.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	13.75c.
Lead, American pig	7.00c. to 8.00c.
Lead, bar	8.00c. to 9.00c.
Lead, sheets, cut	10.50c.
Antimony, Asiatic	14.50c.
Alum., virgin, 99 per cent plus	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	36.50c. to 38.50c.
Babbitt metal, commercial grade	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	60.875c.
Tin, bar	62.875c.
Copper, Lake	15.00c. to 15.25c.
Copper, electrolytic	15.00c. to 15.25c.
Copper, castings	14.75c. to 15.00c.
Zinc, slabs	8.75c. to 9.00c.
Lead, American pig	6.50c. to 6.75c.
Lead, bar	10.00c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	23.50c.
Babbitt metal, high grade	64.875c.
Solder, ½ and ½	38.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	11.00c.	11.75c.
Copper, hvy. and wire	10.37½c.	10.87½c.
Copper, light and bottoms	9.37½c.	9.62½c.
Brass, heavy	6.25c.	6.875c.
Brass, light	5.00c.	5.75c.
Hvy. machine composition	9.37½c.	9.87½c.
No. 1 yel. brass turnings	7.37½c.	7.87½c.
No. 1 red brass or compos. turnings	9.00c.	9.50c.
Lead, heavy	4.75c.	5.12½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c	14.75c.
Zinc	3.75c.	4.12½c.

IRON AND STEEL SCRAP

. . . Although mill buying is still absent, downward trend of prices is being halted.

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. . . Composite figure remains at $17.92.

MAY 25.—For the first time in seven weeks, No. 1 steel is quoted at the same level as the previous week at Pittsburgh, Chicago and Philadelphia, and THE IRON AGE composite figure remains unchanged at $17.92, still the lowest average since Jan. 4. No. 1 steel is off somewhat at Cleveland, Youngstown, Cincinnati and Boston, and there have been declines in other grades, but the brakes have been put on the downward slide. Mill buying has yet to be seen, however, and it is estimated that scrap piles at mills run from 45 to 90 days' requirements. Some shipments on old orders are being held up. Scrap is not coming out in any volume at present figures, and the restriction of supply is a strengthening factor.

Export prices are weaker in the face of small buying and continued railroad restrictions.

Pittsburgh

Following the sale of No. 1 steel at $19 a ton, reported last week, an additional moderate sized tonnage was sold into consumption at the same figure. These sales will probably be influential in stopping the downward trend in prices as most dealers are not finding scrap plentiful at prices they are offering. While some coverages are being made at $18.50 a ton, other brokers are paying $18.75. Within the next week a definite answer to the question which has been overshadowing the market for some time, as to whether scrap is really plentiful, will probably be forthcoming.

Chicago

Mill buying is still in a slump, little activity having been noticed since prices began their downward march. A few small mills are believed to have picked up some tonnages, but the heavy consumers have shown practically no interest The price of No. 1 steel is unchanged this week, but there have been numerous reductions throughout the remainder of the list, ranging from 50c. to $1. Mills are understood to have a good deal of scrap on order, mostly taken at about $20.50, and brokers are of the opinion that this material may continue to come in for several weeks yet. Scrap piles at the mills are large, too, although it is difficult to obtain definite information on this subject. It is probably safe to say that from 60 to 90 days' requirements are available at most plants. a

Philadelphia

This market continues listless and weak in the absence of both domestic and export buying. The decision of one mill to take No. 2 and stove plate deliveries again has resulted in a minor flare of activity, but no user has yet come into the market for important lots of No. 1, the result being that the $18 to $18.50 quotation for the latter is nominal and probably somewhat higher than its true market position. Railroad grades and a few specialties have declined from $1.50 to 50c. on the basis of sporadic sales, and several of the cast grades are lower as a reflection of a sharp reduction in foundry buying. The heavy railroad storage rates are preventing brokers from accumulating export tonnages in the current soft market.

Cleveland

Practically all grades are off 50c. a ton in this district on continued absence of consumer buying. No mill purchase was reported here last week, nor at Youngstown, where prices have also broken. Most consumers either have in their yards or on order sufficient tonnage to last them for from 45 to 60 days. At least one nearby mill has recently held up shipment owing to labor uncertainty, and some shipments by water have also been affected.

Buffalo

The market seems to be at the same level as in the previous week. The softness still prevails. This has been ascribed by dealers to a scarcity of ships for export scrap with a consequent backing up of tonnage; to the uneasy labor situation, and other factors. One of the large consuming interests has been able to buy No. 1 steel in quantity at $18, and most dealers are looking for even lower figures.

St. Louis

Steel mills in the St. Louis district are so well stocked with scrap iron that they are not buying, with the result that prices declined further this week. The mills have on hand or have bought enough scrap to supply them for the next 45 days to four months. There also is said to be some distress scrap in hands of dealers, which has a weakening effect on the market. A Missouri-Kansas-Texas Railway list of 900 tons was sold mostly in St. Louis.

Cincinnati

The old materials market is quiet. Sales of recent railroad lists being reported at current prices, the downward slide of bids has halted. Some adjustments in leading items have been made, but these are only nominal. Dealers refuse to purchase except for application on orders, since yard supplies are still ample.

Detroit

Virtually unanimous opinion of brokers, principal consumers and sellers is that, despite a pessimistic turn of mind engendered by the price slump, there is no real evidence upon which further general reductions in quotations could be based. Except on two items, long turnings and low phos plate, prices in Detroit market are unchanged. Brokers are taking on moderate amounts of scrap at present prices, indicating that they believe that the market has leveled off. Less scrap will be offered from now on as the auto concerns cease production on present models to prepare for new ones.

New York

The local market is extremely dull, and prices are practically nominal for lack of consumer purchases and yard selling. In fact, scrap is not coming into the yards, because the pushcart men find it not worth the effort to bring in old material at present offerings. One large consumer is holding up shipments on old orders, despite a high operating rate, and the presence of distress scrap is a further demoralizing factor. There are no new developments in exports, although material is going forward on previous orders. In sympathy with the domestic market, export prices are off.

Boston

Although heavy melting steel scrap prices have been lowered to conform with those at Pittsburgh, there are signs elsewhere in the market of a firmer undertone. Weirton consumers have raised offers on bundled skeleton or shoveling 25c. a ton, and have met offers of $9 to $9.50 a ton on cars by eastern Pennsylvania consumers. Breakable cast is very firm at $13.10, while cleaned engine blocks at $12.00 to $12.50 on cars and No. 2 cast at $12 to $12.25 show a firmer undertone. The American Steel & Wire Co., Worcester, has entered the market, offering $15.50 a ton delivered for No. 1 steel and $14 for No. 2, but obtaining material only from local and western Massachusetts shippers. No particular change is noted in the exports.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.50 to $19.00
Railroad hvy. mltng.	19.75 to 20.25
No. 2 hvy. mltng. steel.	16.50 to 17.00
No. 2 RR. wrought	18.50 to 19.00
Scrap rails	20.50 to 21.00
Rails 3 ft. and under	25.00 to 25.50
Comp. sheet steel	19.00 to 19.50
Hand bundled sheets	17.00 to 17.50
Hvy. steel axle turn.	17.00 to 17.50
Machine shop turn.	14.25 to 14.75
Short shov. turn.	15.00 to 15.50
Mixed bor. & turn.	14.00 to 14.50
Cast iron borings	14.00 to 14.50
Cast iron carwheels	19.00 to 19.50
Hvy. breakable cast.	15.50 to 16.00
No. 1 cupola cast.	19.00 to 19.50
RR. knuckles & cplrs.	25.00 to 25.50
Rail coil & leaf springs	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
Low phos. billet crops	25.50 to 26.00
Low phos. sh. bar	24.50 to 25.00
Low phos. punchings	22.50 to 23.00
Low phos. plate, hvy.	24.00 to 24.50
Low phos. plate clip	22.50 to 23.00
Steel car axles	24.50 to 25.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$17.00 to $17.50
No. 2 hvy. mltng. steel.	16.00 to 16.50
Comp. sheet steel	16.50 to 17.00
Light bund. stampings.	12.50 to 13.00
Drop forge flashings	15.50 to 16.00
Machine shov. turn.	12.00 to 12.50
Short shov. turn.	12.00 to 12.50
No. 1 busheling	16.00 to 16.50
Steel axle turnings	13.50 to 14.00
Low phos. billet and bloom crops	23.50 to 24.50
Cast iron borings	12.00 to 12.50
Mixed bor. & turn.	12.00 to 12.50
No. 2 busheling	12.00 to 12.50
No. 1 cast.	19.00 to 19.50
Railroad grate bars	11.50 to 12.00
Stove plate	9.50 to 10.00
Rails under 3 ft.	23.50 to 24.00
Rails for rollings	21.00 to 21.50
Railroad malleable	20.50 to 21.00
Cast iron carwheels	22.50 to 23.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.00 to $18.50
No. 2 hvy. mltng. steel.	16.00 to 16.50
Hydraulic bund., new.	18.00 to 18.50
Hydraulic bund., old.	15.50 to 16.00
Steel rails for rolling	21.00 to 21.50
Cast iron carwheels	19.50 to 20.00
Hvy. breakable cast.	18.00 to 18.50
No. 1 cast.	20.00 to 20.50
Stove plate (steel wks.)	14.50 to 15.00
Railroad malleable	19.00 to 19.50
Machine shop turn.	13.00 to 13.50
No. 1 blast furnace	12.00 to 12.50
Cast borings	12.50 to 13.00
Heavy axle turnings	16.00 to 16.50
No. 1 low phos. hvy.	25.00 to 25.50
Couplers & knuckles	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
Steel axles	25.50 to 26.00
Shafting	23.50 to 24.00
No. 1 RR. wrought	19.50 to 20.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.00 to 16.50
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel.	$16.50 to $17.00
Auto. hvy. mltng. steel, alloy free	15.50 to 16.00
No. 2 auto. steel.	13.00 to 13.50
Shoveling steel	16.50 to 17.00
Hydraul. comp. sheets.	15.50 to 16.00
Drop forge flashings	14.50 to 15.00
No. 1 busheling	15.50 to 16.00
Rolled carwheels	20.00 to 20.50
Railroad tires, cut	21.50 to 22.00
Railroad leaf springs	21.00 to 21.50
Steel coup. & knuckles	20.00 to 20.50
Axle turnings	16.00 to 16.50
Coil springs	22.00 to 22.50
Axle turn. (elec.)	16.50 to 17.00
Low phos. punchings	20.50 to 21.00
Low phos. plates, 12 in. and under	20.50 to 21.00
Cast iron borings	10.00 to 10.50
Short shov. turnings	11.00 to 11.50
Machine shop turn.	9.00 to 9.50
Rerolling rails	20.50 to 21.00
Steel rails under 3 ft.	20.00 to 20.50
Steel rails under 2 ft.	21.00 to 21.50
Angle bars, steel	20.00 to 20.50
Cast iron carwheels	19.00 to 19.50
Railroad malleable	19.50 to 20.00
Agric. malleable	16.50 to 17.00
Iron car axles	24.50 to 25.00
Steel car axles	$22.50 to $23.00
No. 1 RR. wrought	15.00 to 15.50
No. 2 RR. wrought	15.00 to 15.50
No. 2 busheling, old	8.50 to 9.00
Locomotive tires	18.00 to 18.50
Pipes and flues	13.50 to 14.00
No. 1 machinery cast.	15.00 to 15.50
Clean auto. cast.	14.00 to 14.50
No. 1 railroad cast.	14.00 to 14.50
No. 1 agric. cast.	13.00 to 13.50
Stove plate	11.00 to 11.50
Grate bars	12.00 to 12.50
Brake shoes	11.50 to 12.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$18.00 to $18.50
No. 2 hvy. mltng. steel.	16.25 to 16.75
Scrap rails	19.00 to 19.50
New hvy. b'ndled sheet	16.25 to 16.75
Old hydraul. bundles	15.25 to 15.75
Drop forge flashings	16.25 to 16.75
No. 1 busheling	16.25 to 16.75
Hvy. axle turnings	13.50 to 14.00
Machine shop turn.	12.00 to 12.50
Knuckles & couplers	21.00 to 21.50
Coil & leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Low phos. billet crops	21.50 to 22.00
Shov. turnings	13.00 to 13.50
Mixed bor. & turn.	11.00 to 11.50
Cast iron borings	11.00 to 11.50
Steel car axles	20.00 to 20.50
No. 1 machinery cast.	18.50 to 19.00
No. 1 cupola cast.	17.50 to 18.00
Stove plate	14.00 to 14.50
Steel rails under 3 ft.	21.50 to 22.50
Cast iron carwheels	17.00 to 17.50
Railroad malleable	19.50 to 20.00
Chemical borings	12.00 to 12.50

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$15.00 to $17.00
Scrap steel rails	17.00 to 19.00
Short shov. turnings	9.00 to 10.00
Stove plate	9.00 to 11.00
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 18.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:

Selected hvy. steel	$16.00 to $16.50
No. 1 hvy. melting	16.50 to 17.00
No. 2 hvy. melting	13.50 to 14.00
No. 1 locomotive tires.	19.00 to 19.50
Misc. stand.-sec. rails.	17.00 to 17.50
Railroad springs	20.00 to 20.50
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought	16.00 to 16.50
No. 1 busheling	12.00 to 12.50
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	18.50 to 19.00
Machine shop turn.	9.00 to 9.50
Heavy turnings	12.50 to 13.00
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	13.50 to 14.00
Steel rails under 3 ft.	19.00 to 19.50
Steel angle bars	18.00 to 18.50
Cast iron carwheels	19.00 to 19.50
No. 1 machinery cast.	14.50 to 15.00
Railroad malleable	19.00 to 19.50
No. 1 railroad cast.	14.00 to 14.50
Stove plate	11.50 to 12.00
Agricul. malleable	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	12.75 to 13.25

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	12.00 to 12.50
Scrap rails for mltng.	17.50 to 18.00
Loose sheet clippings.	10.50 to 11.00
Bundled sheets	14.00 to 14.50
Cast iron borings	8.00 to 8.50
Machine shop turn.	8.50 to 9.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	19.50 to 20.00
No. 1 locomotive tires.	15.50 to 16.00
Short tails	19.50 to 20.00
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast.	14.00 to 14.50
No. 1 railroad cast.	14.00 to 14.50
Burnt cast.	9.50 to 10.00
Stove plate	9.50 to 10.00
Agricult. malleable	15.00 to 15.50
Railroad malleable	16.25 to 16.75
Mixed hvy. cast.	12.00 to 12.50

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Borings and turnings	10.25 to 10.75
Long turnings	9.50 to 10.00
Short shov. turnings	10.50 to 11.00
No. 1 machinery cast.	15.50 to 16.00
Automotive cast.	16.00 to 16.50
Hydraul. comp. sheets.	15.50 to 16.00
Stove plate	9.50 to 10.00
New factory bushel	14.00 to 14.50
Old No. 2 busheling	10.00 to 10.50
No. 2 busheling (black fender stock)	11.50 to 12.00
Sheet clippings	10.50 to 11.00
Flashings	14.00 to 14.50
Low phos. plate scrap.	15.00 to 15.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.50 to $19.00
Hydraulic bundles	18.00 to 18.50
Machine shop turn.	13.50 to 14.00

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Hvy. breakable cast.	15.75 to 14.25
No. 1 machinery cast.	15.00 to 15.50
No. 2 cast.	14.00 to 14.50
Stove plate	11.00 to 11.50
Steel car axles	25.00 to 26.00
Shafting	19.50 to 20.00
No. 1 RR. wrought	17.00 to 17.50
No. 1 wrought long	16.00 to 16.50
Spec. iron & steel pipe	13.50 to 14.00
Rails for rolling	18.50 to 19.00
Clean steel turnings	9.00 to 9.50
Cast borings	9.50 to 10.00
No. 1 blast furnace	9.50 to 10.00
Cast borings (chem.)	12.00 to 12.50
Unprepar. yard scrap	9.00 to 9.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.	$17.50 to $18.00
No. 1 hvy. cast cupola.	15.00 to 15.50
No. 2 cast	14.50 to 15.00

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$13.30
Scrap rails	13.30
No. 2 steel	12.25
Breakable cast.	13.10
Machine shop turn.	$9.00 to 9.50
Mixed bor. & turn.	9.00 to 9.50
Bund. skeleton long.	11.75
Shafting	18.00 to 18.50
Cast bor. chemical	9.50 to 10.25
Per gross ton delivered consumers' yards:	
Textile cast	$17.00 to $19.00
No. 1 machine cast.	18.00 to 19.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton

	Toronto	Montreal
No. 1 hvy. mltng. stl.	$12.50	$13.00
No. 2 hvy. mltng. stl.	11.50	12.00
Mixed dealers steel	11.00	11.75
Scrap pipe	10.00	9.75
Steel turnings	8.00	8.50
Cast borings	9.25	9.50
Machinery cast.	16.00	17.00
Dealers cast.	14.00	15.00
Stove plate	12.00	12.75

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges.

No. 1 hvy. mltng. steel.	$15.00
No. 2 hvy. mltng. steel.	14.00
No. 2 cast.	13.00
Stove plate	11.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$16.00
No. 2 hvy. mltng. steel.	15.00
Rails (scrap)	16.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	$17.50 to $18.00*
No. 2 hvy. mltng. steel.	16.50 to 17.00*

* Nominal.

New Orleans, f.a.s., Stuyvesant Dock

No. 1 hvy. mltng. steel.	$17.50
No. 2 hvy. mltng. steel.	16.50

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00

Rods over 9/32 in. to 47/64 in., inclusive, $5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.74c.
Del'd New York	2.78c.
F.o.b. Birmingham	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars Pacific Ports	3.00c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.55c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.60c.
Del'd Detroit	2.70c.
F.o.b. cars dock Gulf ports	2.95c.
F.o.b. cars dock Pacific ports	2.95c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.40c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.80c.
F.o.b. cars dock Pacific ports	2.80c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.435c.
Del'd New York	2.53c.
F.o.b. Birmingham	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

	Base per Lb.
F.o.b. Pittsburgh	3.80c.
F.o.b. Chicago	3.85c.
F.o.b. Coatesville	3.90c.
F.o.b. cars dock Gulf ports	4.20c.
F.o.b. cars dock Pacific ports	4.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.455c.
Del'd New York	2.5025c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb.	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.69c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10 wrought iron, Pgh.	4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.44c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	3.10c.
No. 10 gage, f.o.b. Gary	3.20c.
No. 10 gage, f.o.b. Detroit	3.30c.
No. 10 gage, del'd Philadelphia	3.39c.
No. 10, f.o.b. Granite City	3.30c.
No. 10 gage, f.o.b. Birmingham	3.25c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.55c.
No. 20 gage, f.o.b. Gary	3.65c.
No. 20 gage, del'd Detroit	3.75c.
No. 20 gage, del'd Philadelphia	3.84c.
No. 20, f.o.b. Granite City	3.75c.
No. 20 gage, f.o.b. Birmingham	3.70c.
No. 20 gage, f.o.b. cars, dock, Pacific ports	4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.09c.
No. 24, f.o.b. Granite City	4.00c.
No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c.

Electrical Sheets
(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars, dock, Pacific ports	4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.35
Standard cokes, f.o.b. Gary	5.45
Standard coke, f.o.b. Granite City	5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

	Base per Box
F.o.b. Pittsburgh	*$4.65
F.o.b. Gary	* 4.75
F.o.b. Granite City	4.85

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate
(*F.o.b. Pittsburgh*)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$11.00
15-lb. coating I.C.	13.00
20-lb. coating I.C.	14.00
25-lb. coating I.C.	15.00
30-lb. coating I.C.	16.25
40-lb. coating I.C.	18.50

Hot-Holled Hoops, Bands, Strip and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold-Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.48c.
F.o.b. Worcester	3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.45c.
No. 20, Pittsb'gh or Cleveland	3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above. Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	$2.75
Cut nails, carloads	$3.60

	Base per 100 Lb.
Annealed fence wire	$3.20
Galvanized fence wire	3.60
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column.	74
Single loop bale ties, base col....	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are 3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld			*Butt Weld*		
Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	52	31	⅛ & ¾	+13	+35
¼ to ⅜	55	38½	½	20	1½
½	59½	49	¾	26	8
¾	62½	53	1 & 1¼	30	14
1 to 3	64½	55½	1½	34	16½
			2	33½	16

Lap Weld			*Lap Weld*		
2	57	47½	2	26½	10
2½ & 3	60	50½	2½ to 3½	27½	12½
3½ to 6	62	52½	4	29½	16
7 & 8	61	50½	4½ to 8	28½	15
9 & 10	60½	50	9 to 12	24½	10
11 & 12	59½	49			

Butt Weld, extra strong, plain ends					
⅛	50½	36½	⅛ & ¾	+14	+48
¼ to ⅜	52½	40½	½	21	4
½	57½	48½	¾	27	10
¾	61½	52½	1 to 2	34	17½
1 to 3	63	55			

Lap Weld, extra strong, plain ends					
2	55	46½	2	29½	13½
2½ & 3	59	50½	2½ to 4	35	20½
3½ to 6	62½	54	4½ to 6	33½	19
7 & 8	61½	51	7 & 8	34½	19½
9 & 10	60½	50	9 to 12	28	15½
11 & 12	59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. o.d.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d.	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2½ in. o.d.	12 B.W.G.	19.37	17.21
2¾ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
3 in. o.d.	12 B.W.G.	23.60	20.97
4½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	56.00
F.o.b. dock, Seattle.....	56.00
4-in., f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, $3 extra. 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46, Birmingham, and $54 delivered Chicago; and 4-in. pipe, $49, Birmingham, and $58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. x 6 in. and smaller.	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
½ in. and smaller	65
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quality. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 10
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60
Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 5
Stove bolts in bulk	81½

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lbs.
F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	65 and 5
F.o.b. Cleveland	65 and 5
F.o.b. Chicago and Birmingham	65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets.	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	24s. to 25s.
Steel bars, open-hearth.	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 12s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£15
Galvanized sheets, No. 24 gage	£18 15s.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-france exchange.

Billets, Thomas	£4 7s. 6d.
Wire rods, No. 5 B.W.G.	£5 2s. 6d.
Steel bars, merchant	£5
Sheet bars	£4 8s. 6d.
Plate ¼ in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large .....1 to 24 kegs	3.90c.
	Per Cent Off List
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO *Base per Lb.*

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.
	Per Cent Off List
Machine bolts	*60
Carriage bolts	*60
Lag screws	*55 and 5
Hot-pressed nuts, sq. tap or blank	*60
Hot-pressed nuts, hex. tap or blank	*60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more, per keg	$3.20
Cement c't'd nails, 15 kegs or more, per keg	$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	6.50 to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.00 to 5.72c.
Long terne sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ⅛ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	$3.40
	Per Cent Off List
Machine bolts, square head and nut:	
All diameters. Prices on application	
Carriage bolts, cut thread:	
All diameters. Prices on application	

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

† 125 lb. and more.

ST. LOUIS *Base per Lb.*

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel(squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold - fin. rounds, shafting, screw stock	4.54c.
Hot - rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base Per Lb.
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
‡Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI *Base per Lb.*

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles.	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.85
Com. wire nails, base per keg:	
Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO *Base per Lb.*

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	**4.22c.**
Hoops	**4.22c.**
Heavy hot-rolled sheets	**3.97c.**
Com. wire nails, base per keg	$3.21
Black wire, base per 100 lb. (2500-lb lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON *Base per Lb.*

Channels, angles	4.20c.
Tees and zees, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern.	6.03c.
Bar and bar shapes(mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.71c.
Boiler rivets, cone head (keg lots)	4.81c.
Track spikes (keg lots)	4.26c.
Track bolts (keg lots)	5.71c.
Black annealed wire (No. 6 to No. 9 incl.)	4.66c.
Com. wire nails and cement coated nails 1 to 14 kegs	3.31c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller	65-10
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates ¼ in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bdls. or more	$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

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* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	$3.30
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.65	$3.60	$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucy, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester, Pa.	$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 88c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

Fo.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$23.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.70
Ferrotungsten, lots of 5000 lb.	$1.75
Ferrotungsten, smaller lots	$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	101.50
2.50% carbon grade	106.50
2% carbon grade	111.50
1% carbon grade	121.50

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	45c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid delivered nominal	$22.00 to $24.00
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	24.50 to $25.00
Turkish, 45-46%	20.50 to 21.00
Turkish, 44%	19.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	$25.50 to $26.00
50%	24.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$19.00 to $20.00
Domestic, barge and rail	$19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$20.00 to 21.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.35c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke	*Per Net Ton*
Furnace, f.o.b. Connellsville, Prompt	$4.60 to $4.75
Foundry, f.o.b. Connellsville, Prompt	5.25 to 6.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal	*Per Net Ton*
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45


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THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . While current orders are high, inquiries are falling off as extended deliveries and unsettled price situation slow up future commitments.

o o o

. . . Uncertainties of labor situation also a factor.

o o o

. . . Packard buys for new transmission and plans expansion of capacity.

Chicago

INQUIRIES on hand indicate a decline in orders during July and August, although sellers report a good volume of current business and no improvement in deliveries. The main factor in this lack of interest on the part of buyers seems to be uncertainty because of labor conditions, and an unsettled price situation as a result of the long-term deliveries which are now being quoted. Neither buyers nor sellers have any means of knowing definitely what costs will be over the remainder of the year, and this doubt naturally is slowing up plans for future buying. Farm implement makers, however, are engaged on a long-range buying program which extends into 1940. Some of the labor difficulties in Milwaukee have been settled, but there is still enough trouble in that region to have an effect on tool buying. An unusually good market exists for second-hand machine tools, but there seem to be few available. There is a possibility that the locomotive diesel engine activities of the Winton Engine Co., General Motors subsidiary, may be transferred from Cleveland to the LaGrange, Ill., plant of the Electro-Motive Corp., in which case some new tool buying is probable. It has developed that most of the $1,500,000 to be spent by Nash-Kelvinator will be for miscellaneous improvements, rather than for a large quantity of tools. A number of multiple-spindle drill units have been purchased by the Caterpillar Tractor Co.

Cincinnati

MACHINERY demand is unabated. Manufacturers report steady ordering for all types of tools from widely scattered sources. Automobile companies continue to work out their retooling programs, and aviation interests are returning to the market for additional equipment. Inquiry is brisk, and the trade maintains its optimism. Production is still at a high rate. Delivery dates are being extended.

New York

VOLUME of inquiries and orders is holding up remarkably well, although one representative reports all May business placed in the first few days of the month. Others report May orders ahead of the April volume of like date. All of the large representative metalworking shops are issuing purchase orders regularly, and railroad buying is in evidence for the first time in many years. The New York Central closed on a number of machine tools, including radial drills, shapers, planers and press brakes. Two turret lathes have yet to be closed. Two welding equipment makers also bought some equipment during the past week. Deliveries are becoming more indefinite than ever and in some instances are being quoted into next year. This situation has tended to slow up commitments in some quarters, as buyers cannot anticipate their requirements as far ahead as eight months.

Detroit

WITH the Buick plant finally in production on an automatic transmission to be offered as optional equipment for Oldsmobile, Packard is in the market for some machinery for a new transmission to be used in its 1938 models. In addition, Packard is prepared for large machinery purchases with the idea of increasing its production to meet customer demand that has been growing for this line in the last year or two. Chrysler has been buying heavily for its Windsor, Ont., plant in the last week.

Pittsburgh

INQUIRIES have declined further in the past week, and the intense pressure which existed a month ago is lacking. Orders have also leveled off somewhat. In view of the record-breaking pace in April, the present reaction is not surprising to most dealers. The labor outlook at some steel and manufacturing plants is undoubtedly responsible for part of the recession in buying. On the other hand, recent price increases caused some customers to speed up their commitments. A more normal trend in transactions is now expected, and total volume of business this month will probably be well below that of April.

Cleveland

MACHINE tool business with manufacturers continues good, although not quite as active as early in the month. Dealers report a moderate volume of business, mostly in single tool orders for small machines. The rubber and electrical industries are among the most active buyers. Strikes are fairly numerous in metalworking plants in this territory and are affecting the volume of business. Some buyers have unsuccessfully attempted to place orders that are cancellable in case of strikes in their plants. Extended deliveries are also causing some hesitation among prospective purchasers. Foreign demand continues very active.

British Steel Output Holds at High Level

LONDON (*special correspondence*).—The United Kingdom's pig iron output for April showed a fresh increase, while steel production was again well in excess of the 1,000,000-ton level. According to the figures just issued by the British Iron and Steel Federation, production of steel in April amounted to 1,080,400 tons, or only 29,100 tons less than the all-time record of 1,109,500 tons established in March. Pig iron output totaled 680,700 tons, or 400 tons more than in the preceding month. It was the best month since October, 1929, when 688,700 tons was produced.

Since Jan. 1 the net addition to blast furnace capacity in the United Kingdom has been 11. Of these, two were of new construction, and two were rebuilt and modernized, while the remainder were blown in as raw material became available. The total of 121 furnaces now in blast represents an annual rate of pig iron output of 8,260,000 tons. It compares with a production of 7,690,000 tons in 1936, an increase of 570,000 tons per annum.

Considerable uncertainty exists regarding future deliveries of hematite ore. Freight rates are a growing problem. For cargoes from Spain and North Africa rates have more than doubled since May, 1936.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

American Safety Razor Corp., 315 Jay Street, Brooklyn, has plans for multi-story addition on Myrtle Avenue. Cost close to $500,000 with equipment. William Higginson & Son, 101 Park Avenue, New York, are architects.

Howe Sound Co., 730 Fifth Avenue, New York, has work under way on development of copper-gold ore properties at Chelan mines, Lucerne, Wash., to include all-steel concentrating mill, machine shops, power house and other structures. A mining camp and housing facilities will be provided. Entire project will cost close to $2,000,000.

Air Associates, Inc., Garden City, N. Y., manufacturer of airplanes and parts, plans expansion and improvements, including considerable new equipment. Company has arranged for sale of 40,000 shares of stock, part of proceeds to be used for purpose noted. F. Leroy Hill is president.

Habirshaw Cable & Wire Corp., Yonkers, N. Y., has let contract to Harris Structural Steel Co., 419 Fourth Avenue, New York, for structural steel for one-story addition on adjoining tract. Cost about $350,000 with equipment.

North American Rayon Corp., 261 Fifth Avenue, New York, with main mill at Elizabethton, Tenn., has authorized fund of about $2,500,000 for mill expansion and improvements, including new equipment. Work has been started on addition to power house at Elizabethton mill.

United States Engineer Office, Conchas Dam, N. Y., asks bids until June 1 for galvanized steel wire rope and steel eye bolts (Circular 126).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 8 for turbo-generator sets, Diesel engine-generator sets, distribution switchboards and spare parts (Schedule 751) for Brooklyn Navy Yard; wind intensity and direction indicating equipment, transmitters, master indicator transmitters, repeater indicators and spart parts (Schedule 794) for Brooklyn, Philadelphia and San Pedro yards.

Colonial Beacon Oil Co., 378 Stuart Street, Boston, has plans for new bulk oil storage and distributing plant at Albany, N. Y., with steel storage tank. Cost over $150,000 with equipment.

Schnefel Brothers, 684-90 South Seventeenth Street, Newark, N. J., manufacturers of cutlery, have plans for three-story addition. Cost over $50,000 with equipment. Raymond B. Flatt, 50 Broad Street, Bloomfield, N. J., is architect.

Taller & Cooper, 103 Lafayette Street, New York, manufacturers of recording instruments and parts, have leased space in building at 930 Newark Avenue, Jersey City, N. J., for plant.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until May 31 for one metal-sawing, filing and polishing machine (Circular 82).

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, has let general contract to Censullo Burke Construction Co., 613 Fifteenth Street, Union City, N. J., for three one and two-story additions to plant at Edgewater, N. J., 155 x 375 ft., 80 x 331 ft., and smaller unit, comprising part of $3,000,000 expansion and improvement program recently authorized at this works.

United States Engineer Office, Philadelphia, asks bids until June 1 for bronze and brass castings, including sleeves, water rings, dowels, tail shaft sleeves, etc. (Circular 453).

Metropolitan Edison Co., Reading, Pa., plans addition to steam-electric generating station at West Reading, including new 25,000-kw. turbo-generator unit and auxiliary equipment. Extensions will be made in transmission lines. Entire project will cost close to $3,000,000.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until June 1 for 50 oxyacetylene torches and paint sprayer guns (Aero Req. 1286); until June 2, one hardness-testing machine (S. & A. Req. 6826), two stud setters and one set of jaws for same (S. & A. Req. 6805); until June 3, 10,000 steel washers (Aero Req. 1153).

NEW ENGLAND

Cushman Chuck Co., Windsor Street, Hartford, Conn., has asked bids on general contract for one-story addition, 42 x 158 ft., and improvements in present plant. Cost over $50,000 with equipment. Mylchreest & Reynolds, 238 Palm Street, are architects.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 2 for steel, bronze, aluminum alloy and gray iron castings, totaling 7000 casting units in all (Circular 260), 1100 latch assemblies (Circular 261), 10,000 ft. of stranded wire (Circular 263).

Smith Paper, Inc., Lee, Mass., manufacturer of tissue and kindred paper stocks, has let general contract to Fred T. Ley & Co., Inc., 1215 Main Street, Springfield, Mass., for one-story and basement addition, 150 x 270 ft., for expansion in machine and finishing divisions. Cost over $100,000 with equipment. R. A. Packard is company engineer.

Armstrong Rubber Co., West Haven, Conn., manufacturer of automobile tires and tubes, has plans for two additions, three-stories, 41 x 80 ft., and one-story, 30 x 60 ft. Cost over $75,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

E. Ingraham Co., North Main Street, Bristol, Conn., manufacturer of clocks and clock mechanisms, has let general contract to Torrington Building Co., Torrington, Conn., for one-story hardening room.

BUFFALO DISTRICT

Taylor Instrument Co., 95 Ames Street, Rochester, N. Y., has let general contract to A. W. Hopeman & Sons Co., 569 Lyell Avenue, for one-story and basement addition, 45 x 230 ft. Cost over $70,000 with equipment.

New York State Electric & Gas Corp., Ithaca, N. Y., has plans for new steam-electric generating plant at Dresden, N. Y., where site was secured recently on Lake Seneca, including high-tension power substation and transmission line for connection with present system. Cost about $2,300,000. Company also plans transmission line from Montour Falls to Geneva, N. Y., to cost $687,000 and will expend close to $800,000 for primary and secondary lines for rural electrification, totaling over 800 miles. Company has arranged for note issue of $3,500,000, entire fund to be used for projects noted and other construction.

L. C. Smith & Corona Typewriters, Inc., 701 East Washington Street, Syracuse, N. Y., has begun work on six-story top addition to present two-story plant, totaling about 25,000 sq. ft. additional floor space. Cost over $100,000 with equipment.

SOUTH ATLANTIC

Southern Wire & Iron Works, Inc., 305 Martin Street, S.E., Atlanta, Ga., manufacturer of iron and steel specialties, has let general contract to Bergman, Inc., William-Oliver Building, for one and two-story plant unit, 95 x 100 ft. Cost about $45,000 with equipment. James C. Wise, 161 Spring Street, N.W., is architect.

Contracting Officer, Fort Benning, Ga., asks bids until June 3 for copper wire, weatherproof wire, rubber-insulated wire, cable, bushings, switches, 25-kva. transformers and other equipment (Proposal 148-121).

WASHINGTON DIST.

Purchasing and Contracting Officer, Holabird Quarter master Depot,, Baltimore, asks bids until June 2 for 24 3-ton, truck type, motor vehicle jacks, and 24 1½-ton jacks (Proposal 398-175); until June 3, 54 electric drills (Proposal 398-153); until June 7, 75 electric grinders and 38 tool post electric grinders (Proposal 398-163); 14 electric power hack saws, and three motor-driven, woodworking power saws (Proposal 398-164); 172 portable electric drills, 32 electric grinders, 14 electric shears and 49 portable electric sanders (Proposal 398-157).

Seaboard Steel & Iron Corp., 710 West Ostend Street, Baltimore, has let general contract to Davis Construction Co., 9 West Chase Street, for one-story addition, 150 x 300 ft., primarily for storage and distribution. Cost over $70,000 with equipment. Kubitz & Koenig, Emerson Tower Building, are consulting engineers.

Purchasing Officer, Department of Interior, Washington, asks bids until June 3 for one motor-driven air compressor, one 2½-ton wrecking crane, one hydraulic auto lift, one brake drum, one motor-driven floor-type drill press, one motor-driven floor-type lathe, and one hydraulic press (Proposal 2527) for Crookston, Neb.

General Purchasing Officer, Panama Canal, Washington, asks bids until June 1 for two motor-driven, floor-type dry metal grinding machine, six pneumatic hand paving-breakers, 12 warehouse barrel trucks, 10,000 lb. steel track spikes, six 15-ton screw jacks, galvanized wire rope clips, galvanized chain shackles, galvanized steel eye bolts, sheet brass grommets, brake shoes and other equipment (Schedule 3256).

Rustless Steel & Iron Corp., 1001 Edison Highway, Baltimore, has asked bid on general contract for one-story addition for cold drawing unit, with section for grinding division. Cost over $100,000 with equipment. H. A. Brassert & Co., 310 South Michigan Avenue, Chicago, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 1 for one light-duty engine lathe (Schedule 773), one drill, one pipe and bolt threading and cutting machine, and one sheet-metal combination beading burring, crimping, seaming, shearing, turning and wiring machine (Schedule 774), one ball-bearing, cabinet-type single-cylinder surfacer (Schedule 754), one saw table, band saw, and hand planer and jointer (Schedule 775) for Eastern Navy Yards; two reversible travel-type conveyors (Schedule 766) for Portsmouth Navy Yard. All equipment is to be motor driven.

SOUTH CENTRAL

Swift & Co., Union Stock Yards, Chicago, has let general contract to A. Farnell Blair Co., Lake Charles, La., for new branch packing plant at Lake Charles, with power house, machine shop, sewage treatment works and other structures. Cost close to $500,000 with equipment.

United States Engineer Office, Vicksburg, Miss., asks bids until June 1 for one bulldozer (Circular 256), four tamping rollers (Circular 255), one crawler type tractor crane (Circular 257), six diesel engine-driven crawler-type tractors, equipped with bulldozers (Circular 258), two diesel engine-driven crawler-type dragline excavating machines (Circular 259), 14 truck trailer wagons (Circular 260), one diesel engine-driven crawler-type convertible power shovel dragline (Circular 261).

C. M. Journey Co., 525 South Highland Street, Memphis, Tenn., operating a well-drilling and equipment business, has acquired property at Weaver Road and Highway 61, for new one-story plant for pro-

duction of well-drilling equipment and supplies, parts, etc. Cost over $30,000 with equipment.

Ascension Parish School Board, Donaldsonville, La., has plans for new one-story vocational school on local site. Cost over $65,000 with equipment. Bodman & Murrell, Reymond Building, Baton Rouge, La., are architects.

SOUTHWEST

Skelly Oil Co., Tulsa, Okla., is considering new natural gasoline plant in Lea County, N. M., near oil and natural gas wells in that area, including compressor plant, power house, machine shop and other structures, with steel tank storage and distribution division. Cost close to $500,000 with machinery.

Owens-Illinois Can Co., Ohio Building, Ohio, has asked bids for new one and multi-story tin can and metal-container manufacturing plant at Goodfellow Boulevard and West Florissant Avenue, St. Louis, where more than seven acres recently was acquired. Main unit will comprise about 140,000 sq. ft. floor space. Cost close to $500,000 with equipment. Francisco & Jacobus, 511 Fifth Avenue, New York, are architects and engineers.

Board of Education, Oxford, Kan., has approved plans for new one-story and basement vocational school, 92 x 140 ft. Cost about $60,000 with equipment. Alfred Ames, Wichita, Kan., and Carl Edwards, Wellington, Kan., are architects.

Gulf Oil Corp., Houston, Tex., has plans for extensions and improvements in oil refinery at Port Arthur, Tex., including equipment for gasoline production, primarily of octane type for aviation service. Steel tank storage and distributing facilities will be increased. Cost over $250,000 with equipment. Main offices are in Gulf Building, Pittsburgh.

Deward C. Baird, 206 Esperson Building, Houston, Tex., is at head of project to build two-story baking plant, 90 x 175 ft. Cost close to $100,000 with traveling ovens, conveyors, loaders and other equipment. A. C. Finn., Bankers' Mortgage Building, is architect.

United States Engineer Office, Galveston, Tex., asks bids until June 2 for steel castings, including pump case sections, cast steel ring liners, cast steel impeller, etc. (Circular 89).

American Liberty Pipe Line Co., First National Bank Building, Dallas, Tex., has let contract to National Supply Co., Magnolia Building, for new pumping station for booster service on main steel pipe line from Conroe, Tex., oil field to Houston ship channel, Houston, Tex. Steel tank storage facilities will be increased at last noted point. Entire project will cost close to $100,000.

WESTERN PA. DIST.

Bradford Oil Refining Co., Bradford, Pa., plans expansion and improvements in oil refinery, including cracking and other equipment, solvent dewaxing plant, additions to filter plant and other refinery divisions. Cost about $500,000 with equipment.

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, has plans for new branch plant at Vernon, Los Angeles, comprising main one-story foundry, hammer shop, 80 x 100 ft., general production shop, 60 x 240 ft., and other units, including office building. Cost over $200,000 with equipment. Work will begin early in summer. J. A. Schreiber is company engineer in charge, first noted address.

Owens-Illinois Glass Co., Clark Building, Pittsburgh, has plans for one-story mechanical shop and maintenance building at local plant, super-structure to begin at once. Cost close to $50,000 with equipment. Main offices of company are at Toledo, Ohio.

OHIO AND INDIANA

George Worthington Co., 802 St. Clair Avenue, Cleveland, hardware and mill supplies, has let general contract to H. K. Ferguson Co., Hanna Building, for two additions, five-stories and basement, 100 x 120 ft., and four-stories and basement, 25 x 60 ft., for storage and distribution. Cost about $250,000 with equipment. George S. Rider Co., Terminal Tower Building, is architect and engineer.

Schaefer Equipment Co., Koppers Building, Pittsburgh, manufacturer of drop forged railroad equipment, has taken over former plants of Warren Foundry Co. and Liberty Steel Co., adjoining, Warren, Ohio, and will remodel for new main plant.

Packard Electric Co., Warren, Ohio, manufacturer of electric cables and wires, etc., division of General Motors Corp., will take bids soon for one-story addition, 200 x 400 ft. Cost over $175,000 with equipment.

Crawford Steel Foundry Co., Bucyrus, Ohio, has purchased portion of former plant of W. A. Riddell Corp. and will remodel for production of steel castings. Cost over $65,000 with equipment. F. D. Closser, general manager, Sozonian Vault Co., Bucyrus, is interested in Crawford company.

Taylor-Young Airplane Co., Alliance, Ohio, recently organized to take over plant and business of Taylorcraft Aviation Co., manufacturer of airplanes and parts, is arranging financing through sale of common stock to total about $345,000, part of proceeds to be used for expansion, including one or more shop units and installation of equipment. William C. Young is executive vice-president.

Contracting Officer, Materiel Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until June 1 for 5000 steel self-locking plate nuts, 111,500 steel self-locking nuts and 12,000 brass self-locking nuts (Circular 758), two manometer water instrument testing assemblies, and two manometer mercury instrument testing assemblies (Circular 757); until June 2, seamless steel tubing (Circular 778), 1,321,600 ft. extra flexible cable (Circular 780), 24,000 compensating compass magnets (Circular 750); until June 3, electrical equipments, including galvanized conduiets and fittings, electrical metallic tubing and wire (Circular 755), gasoline flow meters in lots of 15 to 30 (Circular 761), 87 twin-engine fuel mixture indicator assemblies, including spare parts (Circular 767); until June 7, two hydraulic jacks (Circular 787).

Board of School Commissioners, 150 North Meridian Street, Indianapolis, plans manual training shops in three-story addition to Washington high school, for which bids are being asked on general contract until June 2. Cost about $300,000. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects; John M. Rotz Engineering Co., Merchants' Bank Building, is mechanical engineer.

United Tool & Engine Co., Cleveland, recently organized by H. Bernhardt and R. Frey, has established a plant at 5364 St. Clair Avenue for manufacture of tools, dies and molds.

MIDDLE WEST

Wyckoff Drawn Steel Co., 3200 South Kedzie Avenue, Chicago, has let general contract to M. J. Boyle & Co., 1744 North Mozart Street, for one-story and basement addition, 100 x 125 ft. Cost over $85,000 with equipment.

Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, plans extensions and improvements in car shops and power house at repair works, Aurora, Ill., including additional equipment. Cost close to $100,000.

Harrison Radiator Cover Co., Inc., 4718 West Fifth Street, Chicago, has purchased one-story industrial building at Thirteenth Street and Fifty-fifth Court, Cicero, about 50,000 sq. ft. floor space, for plant. Present works will be removed to new location and capacity increased.

Purchasing Officer, Department of Interior, Washington, asks bids until June 17 for new power plant at Cheyenne River Agency, S. D., including generating unit, boilers, stokers, pumps, coal and ash-handling equipment, and accessory equipment (Proposal 2598).

Holly Sugar Corp., Colorado Springs, Colo., has authorized fund of about $2,500,000 for expansion and improvements, including new beet sugar mill at Hardin, Mont., where site has been acquired. It will comprise one and multi-story units, with packing, storage and distributing buildings, power house, machine shop and other mechanical departments. It will represent expenditure of more than $1,000,000 of fund noted. Company will also carry out expansion at branch mill at Alvarado, Cal., including additional equipment.

Acme Steel Co., 2840 South Archer Avenue, Chicago, has let general contract to Lundoff-Bicknell Co., 100 North La Salle Street, for four-story addition to plant at Riverdale, Ill., 95 x 810 ft. Cost close to $1,000,000 with equipment.

City Council, Flandreau, S. D., has plans for new municipal electric light and power plant, for which bond issue of $169,000 has been approved and grant of $70,000 is being secured through Federal aid.

Gillette Rubber Co., Eau Claire, Wis., has placed general contract with Hoeppner-Bartlett Co., local builder, for machine shop extension, 70 x 120 ft., part two stories, to cost $50,000 with equipment.

Consolidated Paper & Water Power Co., Wisconsin Rapids, Wis., has plans for expansion to cost $1,250,000 or more. Sulphite plant is to be extended and two new digesters installed. New pipe line for sulphite transfer to branch mill at Biron, Wis., also is contemplated. George W. Mead is president.

Howard Brass & Copper Co., 608 South Second Street, Milwaukee, has purchased adjoining four-story building of Maxwell-Ray Co., 612 South Second Street, adding about 15,000 sq. ft. for manufacturing and warehousing.

George W. Borg Corp., 469 East Ohio Street, Chicago, manufacturer of electric clocks, has leased additional space for its parts plant at Delavan, Wis., and will install considerable new precision type equipment. Assembly operations will continue at main plant in Chicago.

Gilson Brothers, founders and machinists, Fredonia, Wis., will build a machine shop addition, 40 x 60 ft., to increase output of concrete mixers, motor truck equipment, etc.

Brace Oil Filter Co., 329 East Brown Street, manufacturer of portable units for reclaiming crankcase oil, has leased 14,000 sq. ft. in building at 234 North Broadway to double output and is adding sheet metal division to insure full control of production.

MICHIGAN DISTRICT

Govro-Nelson Co., 1931 Antoinet Street, Detroit, manufacturer of automobile specialties, has asked bids on general contract for one-story shop addition. Cost over $30,000 with equipment. Henry M. Freier, Murphy Building, is architect.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for new plant for manufacture of miscellaneous rubber products on 90-acre tract recently acquired at Riverview, Mich., with power house and other mechanical departments. Cost over $400,000 with equipment.

H. J. Heinz, 1062 Progress Street, Pittsburgh, canner and packer of food products, has let general contract to H. K. Ferguson Co., Cleveland, for new branch plant at Holland, Mich., two-stories, 120 x 440 ft. Cost over $250,000 with equipment.

C. E. Phillips & Co., 5443 Twelfth Street, Detroit, manufacturers of welding equipment and supplies, have let general contract to Rudy-King Co., Detroit, for new one-story plant unit. Cost close to $30,000 with equipment.

Sheller Mfg. Corp., General Motors Building, Detroit, manufacturer of steering wheels for automobiles and motor trucks, and kindred automotive equipment, plans extensions and improvements in plant at Portland, Ind., including new units and equipment. Company has arranged for sale of common stock to total about $495,000, part of fund to be used for purpose noted.

PACIFIC COAST

General Controls Co., Ltd., 624 East Fourth Street, Los Angeles, manufacturer of temperature control equipment, pressure regulators, parts, etc., has plans for new one-story plant on 12-acre tract at Glendale, Cal. Cost about $60,000 with equipment.

California Products Co., Butler Avenue, Fresno, Cal., has let general contract to Trewhitt-Shields & Fisher, Pacific Southwest Building, for one-story addition to winery, in part for storage and distribution, and for improvements in present plant. Cost about $125,000 with equipment. H. Rafael Lake, Mattei Building, is architect.

Bureau of Reclamation, Custom House, Denver, asks bids until June 7 for two vertical-shaft 115,000-hp. hydraulic turbines, and two turbines and two governors with pumping equipment for installation in Boulder power plant (Specifications 734); until June 14, two 82,500-kva. vertical ac., electric generator units with accessories, for same station (Specifications 732).

The Consumer Is King— So What?

(CONTINUED FROM PAGE 42)

You have another striking example of a change forced upon the industry against its will which is bound to seriously affect your interests. Tremendous pressure is being applied, through a combination of legislation and supposed executive mandate to "close shop" a traditionally open-shop industry.

You buyers of steel might say, "we should worry" about that. It is a problem for the steel industry. But it is a foundling that lands squarely on your doorstep.

Do not make the mistake of thinking that the steel industry begat this expensive foundling. It was sired by John Lewis, godfathered by Senator Wagner, nursed by Madame Perkins, pronounced legitimate by the Supreme Court and blessed by the Administration. Then it was carefully tucked in a basket and handed to the steel industry with a tag attached to it reading "take it and like it."

The steel industry does not want this baby because it cannot afford to support it. No industry would voluntarily adopt a cost rise that may run into ten figures, especially when it is earning only 4½ per cent on its capitalization.

The cost of this closed shop baby does not lie so much in the wages that it may exact from its custodians. Increased wages are not so costly as decreased efficiency. And production efficiency cannot help but be seriously damaged when labor leaders take control of production rates and can say "no" to modernization and mechanization.

Do you imagine that there would have ever been the introduction of the continuous mill in this country if steel had been a "closed shop" industry?

The steel industry cannot afford to support this foundling. So it will have to be passed along and put on the steel buyer's doorstep. And the steel buyer, similarly unable to afford the luxury of this expensive child, will have to pass it along to the final consumer, to whom go all of the bills, of necessity, for industrial babies that are born outside of the normal and natural wedlock of industrial evolution through improved efficiency and lower costs.

Will the steel buyer or the steel consumer have a word to say about all of this? Is he asked if he is willing, or able, to undertake the support of this child? He is not. He does not have any more to say about it than did the steel industry.

Closed Shop Is Expensive to Consumers

Some of you may question my statement that a closed shop, in steel, would greatly increase costs and prices. Consider, then, that in the closed shop bituminous coal industry, wholesale prices have risen more than 150 per cent since 1913. This in an over-produced and overmanned industry in which the law of supply and demand would dictate a buyer's market.

Contrast this with your price experience in the open shop steel industry, an industry in which the vigorous state of consumer demand would be expected to provide and form a seller's market. In the steel industry, present prices are less than 25 per cent above the 1913 level.

If steel is forced by political pressure, and indeed against the will of the majority of its labor, to go on the closed shop basis, I predict that within the space of two years, steel production costs may be double what they now are.

Don't you think that you, as buyers of steel, and your customers, who are its ultimate consumers, should have something to say about such a possibility?

A possibility that threatens to take as much as three billion additional dollars per year out of your pockets without giving you one dollar's additional worth of product in exchange!

I am not arguing the question of the moral or legal right of labor to organize if it so pleases. I am not questioning the theory of unionization or the expediency of mass contractual labor relations between capital and labor. I am basing my point on the axiomatic fact that haste makes waste. That you cannot force, by political or legislative pressure, any organization, into being overnight, be it a military army or a labor army, without a resultant inefficiency that is tremendously expensive to the men and women who pay the bills.

The sudden transformation, by fiat instead of gradual evolution, of an open shop industry into a closed shop industry must necessarily bring about vast and fundamental dislocations in the way of doing business. Functions hitherto belonging to management are transferred to the shoulders of an untried and untrained labor leadership, without a corresponding transfer of responsibility. That you may have strong and capable leadership at the top of the labor organization is of no avail unless you have it all along the line. Generals cannot operate or discipline armies unless they have capable lieutenants and captains to assist them.

Wage rate raises that may ensue from closing an open shop industry, as I have pointed out, are the least of the items composing the consumer's increased bill. He must pay far more for the transfer of authority from men who have respected and protected his interest to men who do not care a hang about him.

Can you call to mind a single instance in which organized labor has taken action to confer a price benefit upon consumers of an industry in which that labor makes its living? The fact that you cannot is the most condemning indictment in my opinion, of the quality of union leadership and of the economic purpose of today's unionism.

Unregulated and undisciplined organization of minority groups as pressure groups to secure a group advantage is not new. It is not confined to America. But wherever it is permitted or encouraged to work its unrestricted will, the great mass of consumers suffer social or economic damage.

The statute books of our country are full of laws to regulate and control and limit the organization of business, but there are no laws on our books to regulate, control or limit the organization of labor or its activities. Therein lies the most serious present-day threat to the American consumer.

We have an apt illustration of

the effect of uncontrolled organization of pressure groups in what is and has been occurring in China. Under the favoring atmosphere of a weak central government which has not the power, even if there is the desire to control or prevent or discipline, enterprising generals form their own personal armies. Part of their activities are devoted to fighting each other but their chief occupation and profit lies in raiding the helpless farmer and in rooking a prostrate public. Nor is there discipline and control even in these privateering armies. The allegiance rendered by group and unit commanders is the allegiance of expediency. It is thrown off and discarded the moment some better price is offered or some juicier prize of siege or capture appears upon the horizon.

We call these activities as practised in China by their true name —banditry. In America similar activities are called in certain quarters by a more euphonious title—the development and expression of social consciousness!

God save the American consumer from the full flowering of this strange philosophy which, I repeat, reverses the accepted theory of industrial evolution and thereby promises to make monkeys out of them! But God, it is said, prefers to help those who help themselves.

Have the consumers of America —the buyers of the products which constitute the indispensable lifeblood of industry—made any attempt to help themselves, to protect themselves from the damaging effects of this oncoming Juggernaut of mandatory change before which we are apparently prostrate?

If they have, I have not seen much evidence of it.

I think that it is time that they did so. And I am thinking particularly of you gentlemen who are the principal buyers of the world's most necessary commodity, steel, and who are in a position to most effectively and coherently represent the interests of your customers who are steel's ultimate consumers.

I do not for one moment suggest that you should oppose certain of the so-called objectives of the New Deal, such as the broadening of purchasing power and the raising of wages, nor the principle of collective bargaining which is now accepted as the law of our land. Nor would I suggest that you oppose the attempt to achieve security in sickness and old age. You do not have to be a Democrat of either the old school or the new to support these objectives so long as they are based on sound principles and practice. I know many Republicans who have long supported these objectives in practice as well as precept. And I am heartily in accord with them.

My point is simply the plain practical point on which all sensible men can and should agree. It is that you cannot rob Peter to the point of depletion in order to pay Paul without incurring the danger of sending both of them to the poorhouse.

Is Peter Going to Poorhouse?

Peter is the consumer, whom you gentlemen represent. If you think that he can afford to pay twice as much, per ton, for steel, two years from now as he does today, you and he can well afford to remain quiet and complacent. If you believe, however, as I do, that such a contingency would be likely to put you out of business, or at best result in serious injury, then it is time that you should do something about it before it is too late.

Do not mislead yourselves in thinking that the present activity of demand in steel represents a normal demand. Your customers have just emerged from a five-year starvation diet. A starving man will pay nearly all that he has for a square meal, but after his stomach has been filled he is going to count the pennies left in his pocketbook.

What can you do about it?

Under the previously accepted philosophy of progress through evolution you would know what to do about it. You would have taken your case to the heads of the steel industry. You would have said to them: "We, as buyers of steel, who represent its consumers, support your industry. You and we accept the principle that the progress and enlargement of our mutual activities is dependent upon delivering to consumers progressively better values for the dollars that they pay. We believe that these new policies that you have inaugurated will penalize the consumer and in turn react disastrously upon our interests as well as yours." And your words would have been heard and heeded.

Today, it will do you no good to take your case to the steel industry. For these changes which threaten the welfare of consumers, buyers and producers have not originated within the industry but have been forced upon it from without. And the steel industry's voice does not reach to the banks of the Potomac.

Your voices can and will. Especially since Washington has now begun to get price conscious and pennywise even if still pound foolish.

You can say to the men who make our laws and who are now dictating industrial and business policies: "We represent the people who pay the bills."

"The cost of what you are now doing in changing the long established methods of American business must be borne by the consumers whom we represent. We do not buy pigs in pokes. We require the prospective supplier to submit a bid cost, or estimate. What are these things that you are doing going to cost the consumers and the buyers of steel?

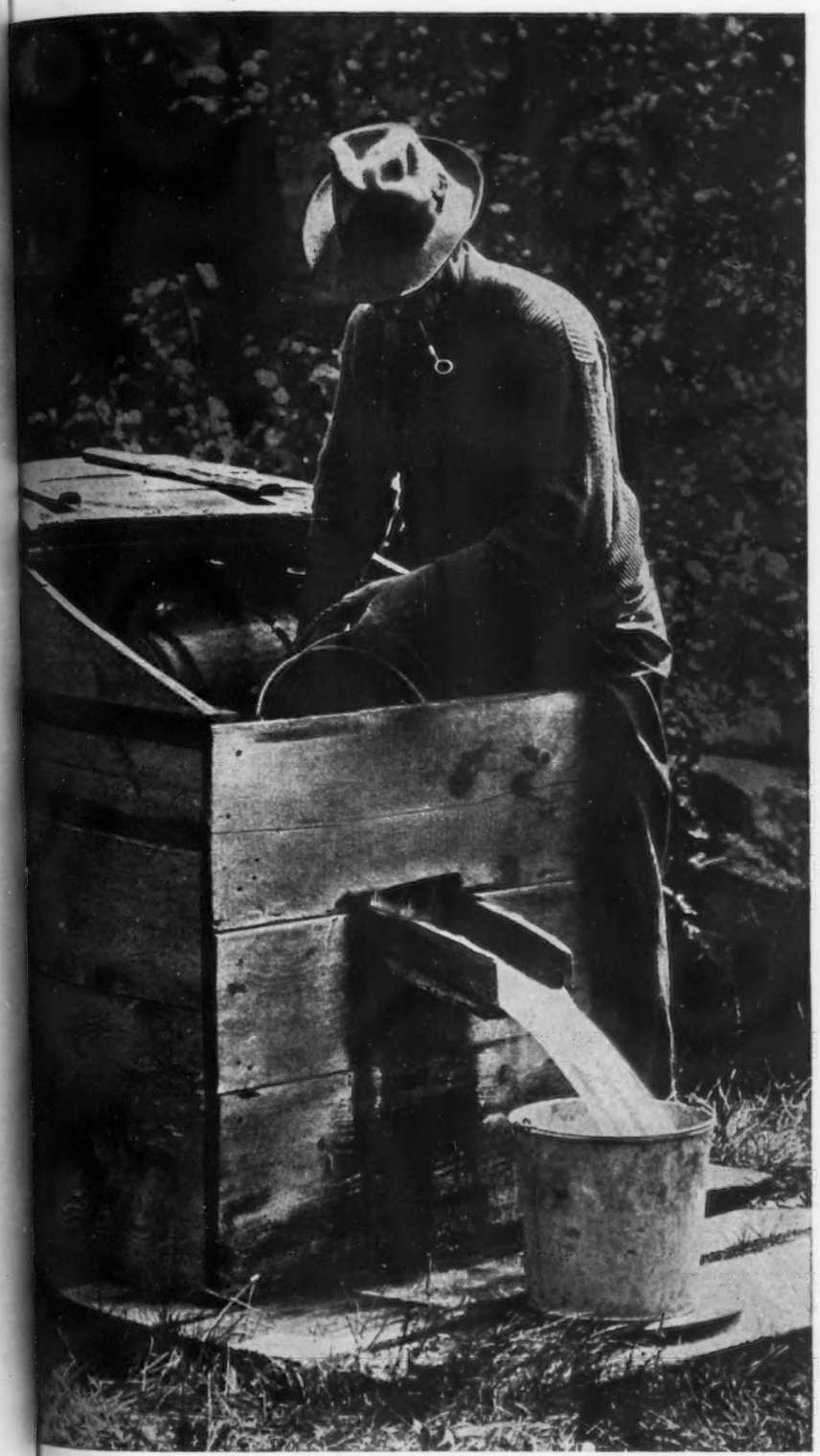
You can say to our lawmakers in Washington, "We believe that the laws pertaining to monopoly should apply to labor as well as to capital. If you insist upon the unionization of the industries from which we buy, you must at least protect us by applying to them the obligations to the public entailed in incorporation or in some act similar to the British Trades Disputes Act." Collective bargaining between capital and labor must not be permitted to become collective bludgeoning of the consumer.

You can say to them: "We, and the consumers whom we represent, demand representation and the consideration of our interests. We do not approve of star chamber proceedings in which but two parties in interest are permitted to meet behind closed doors and determine the prices that we shall pay for what we buy."

Remember, my friends, that progress means change, but that change does not always mean progress. Remember too, that in the past, under the American competitive system of initiative and enterprise, the consumer has been king. He has dictated, directly or indirectly, the course of industrial evo-

YOU DON'T HAVE TO

Go to the Well!



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lution which has built the world's outstanding industrial empire. From time to time, it is true, his rule has been challenged and his rights trespassed upon. But we have always returned to our allegiance. For the consumer's rule has been a beneficent one and in serving him capital and labor have both advanced and profited, and America has gone forward.

It will be a sad day for America when King Consumer abdicates and is succeeded by political economic dictatorship. And saddest of all for the erstwhile king, if we can judge by what has happened to him in those countries abroad which have substituted economic revolution for evolution. We must not let the consumer abdicate in America. I urge you, who are prime ministers to the American consumer, to exert your utmost power in his behalf, now, before it is too late.

In so doing you will be serving no special interest but protecting all interests of all classes of Americans. For whatever is done that will permanently benefit the consumer will benefit all of us and whatever is done that will harm him will eventually injure every man, woman and child in this great country of ours.

Yet, it will require courage, in these peculiar days, to take up the cudgels in defense of today's most forgotten man of all. But courage is the rightful heritage of free Americans. Remember with what enthusiasm we were taught to sing about "the land of the free and the home of the brave." And remember that when America ceases to be the home of the brave, it will no longer be the land of the free.

Developments in Production Metallurgy of Iron and Steel

(CONTINUED FROM PAGE 47)

and coke oven gas either alone or in proper mixtures. Details will not be given here because many papers and articles have been published recently. Fig. 2, taken from the paper by Springorum,[1] shows the excellent results being obtained in Germany, and still better comparative results have been obtained here and in England.

Continuous Mills

The outstanding development in regard to rolling mills continues to be the construction of continuous mills for the rolling of wide thin products. This has been well summarized in a recent paper by Stephen Badlam.[5] This amazing growth began a little over ten years ago. Even at the risk of repetition the following table[6] is given to emphasize this growth and to show the total number of mills. A general view of such a mill is shown in Fig. 3.

When these mills are seen in operation one of the most impressive things about them is the tremendous application of electricity in the form of motors and of control mechanism. It is not too much to say that the modern rolling mills, as we know them, would be impossible without the advances in the various sizes and types of electric motors. In order to bring this home some details are given of the equipment of Bethlehem's continuous strip mill at Lackawanna, N. Y.

When considering these figures it should be remembered this is only one of the wide strip mills, and that the installed capacity of the country will shortly be twenty times that of this one mill.

Many other developments of the industry might be mentioned but enough has been given to show that iron and steel men are still interested in improvements and that considerable progress is being made.

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To Spend $4,000,000 At Cuyahoga Works

AMERICAN Steel & Wire Co. will spend $4,000,000 for rearrangement and rehabilitation of facilities at its Cuyahoga works, according to an announcement by C. F. Blackmer, president. The principal output at Cuyahoga plant consists of rods, wire, cold rolled strip and stainless steel. The cold roll department is the one which will be improved under the present appropriation.

While the program does not call for a great deal of expansion it will, however, modernize the mill through introduction of more economical methods of production and handling, scrapping of old equipment and installation of the most modern machinery for this type of work. When the program is accomplished the plant will have somewhat greater capacity than was available previously. It is expected that the work will be completed within a year.

Booklet on Stainless For Textile Industry

"True Colors, Quick Color Changes—with Textile Equipment of Enduro Stainless Steel" is the title of a new 12-page booklet just released by Republic Steel Corp., Cleveland. The booklet is the result of several years' research on the part of the technical staff of Republic, in collaboration with textile dyers and bleachers in a number of plants.

The new publication sets forth in the textile man's language, the properties and fabrication of stainless steel, describing in detail the types of Enduro stainless steel best suited for this type of application. A feature of the booklet is a series of four-color illustrations showing yarn samples dyed in beakers of porcelain, a non-ferrous alloy, and stainless steel, demonstrating how stainless helps to retain true colors.

Copies of the booklet are available upon request.

Gray Iron Founders Society, Cleveland, will hold its annual meeting in Cleveland June 11 and the members will visit the Great Lakes Exposition the following day, which has been designated as Gray Iron Founders Society Day.